User's Guide™

THE MAGAZINE FOR IBM PC & CP/M SYSTEM USERS

No. 7 $4

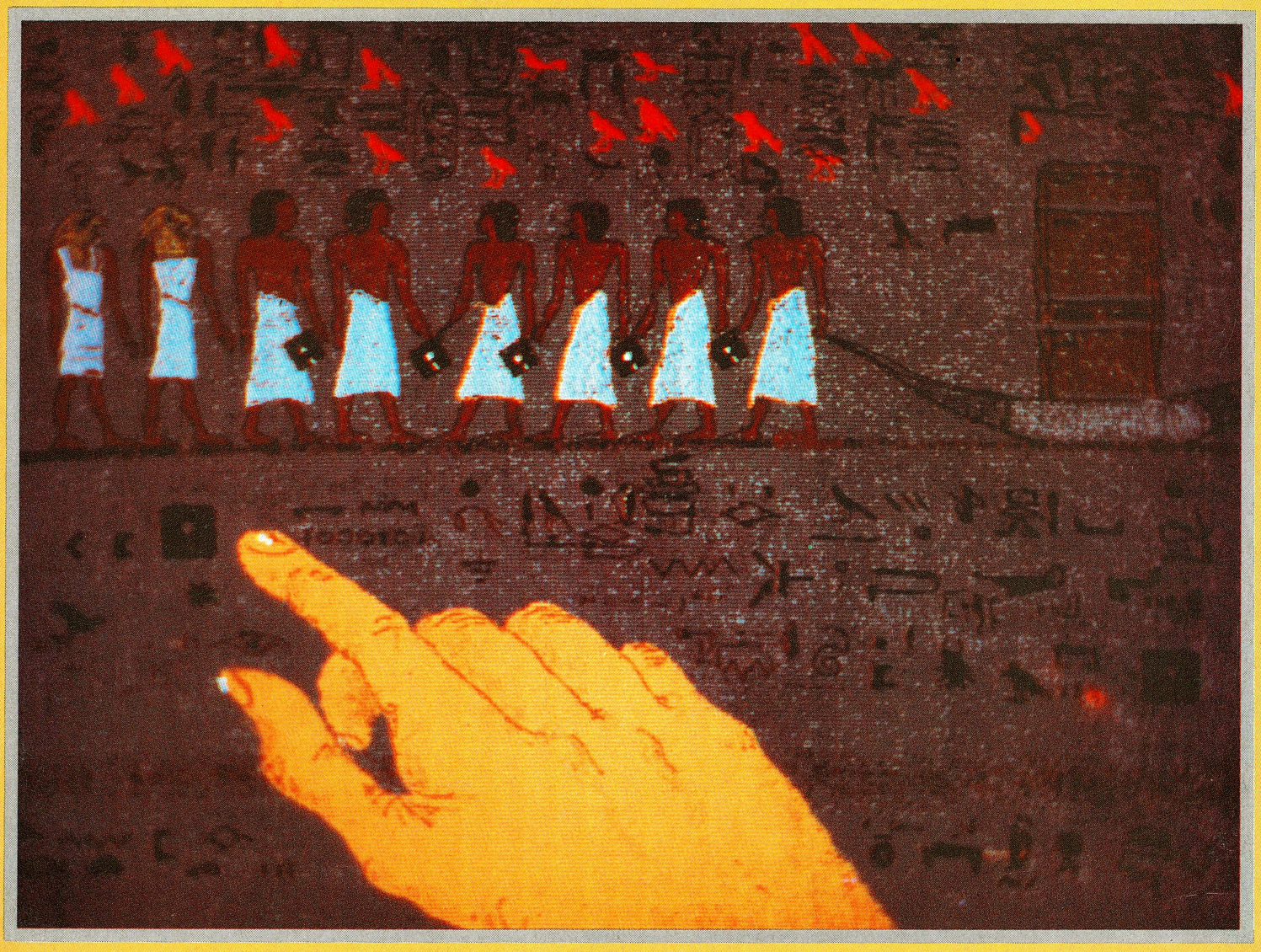
T/MAKER Spreadsheets and Graphics

MS-DOS and PC-DOS Overview

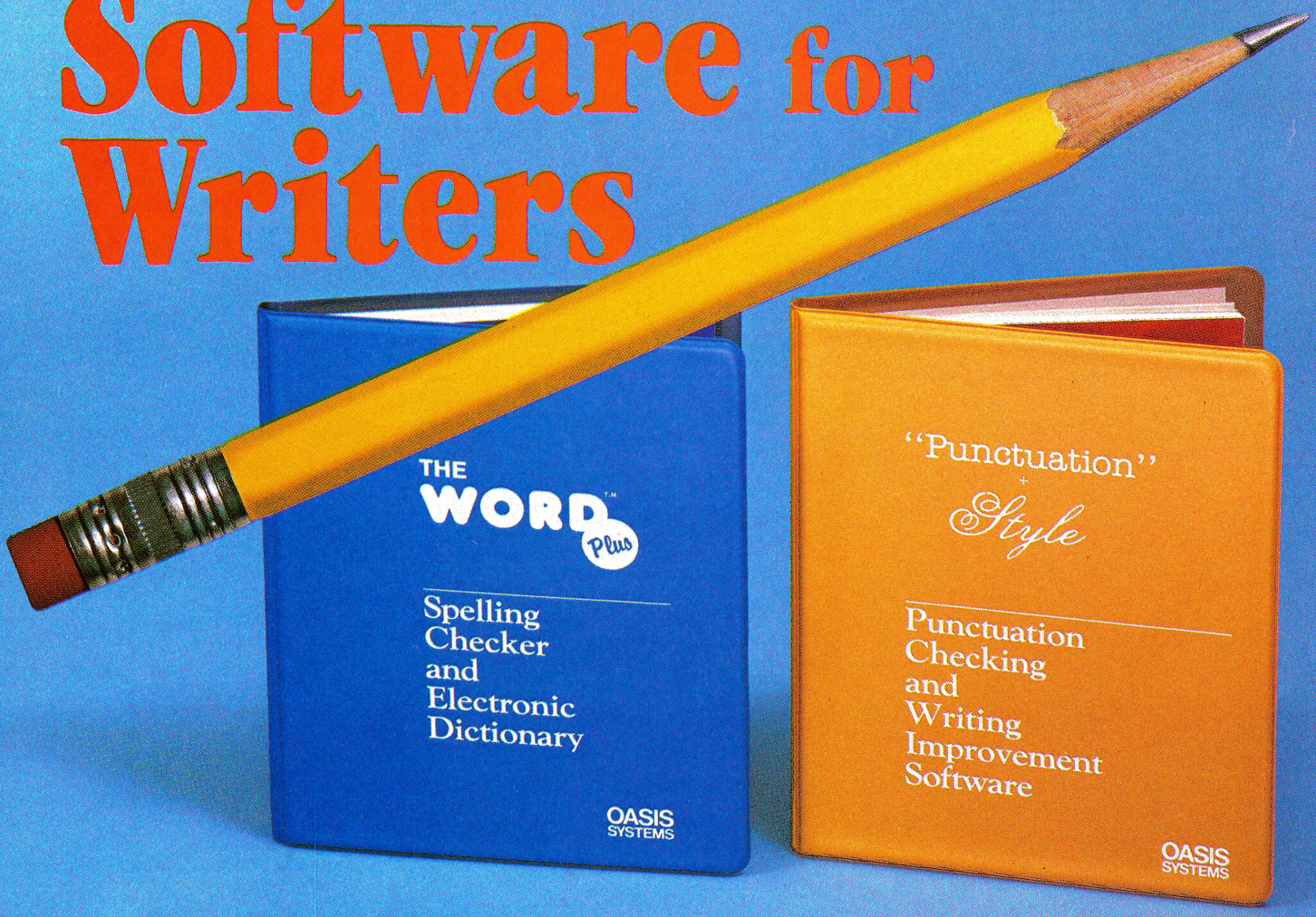
Perfect Writer Proportional Printing

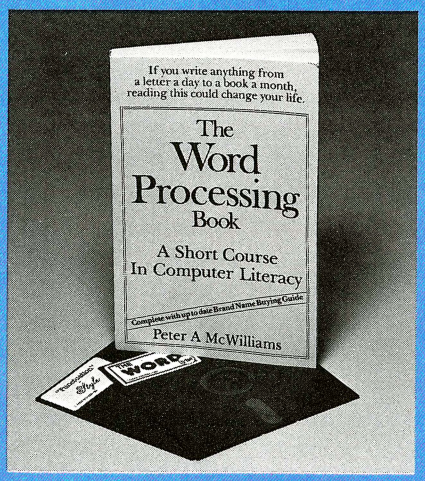
DEC Rainbow

FILEBASE for Personal Data Base Management



Software for Writers





"Oasis Systems' software — Unquestionably the best". . .

Peter McWilliams, author of the #1 best-selling book on word processing.

The WORD Plus is the standard by which other spelling checkers are measured. Here's why:

- *Real* 45,000 word dictionary.
- Shows errors "in-context."
- Interactive word look-up finds correct spelling for you and corrects at the push of a button.
- Hyphenates words automatically.
- Solves crosswords, puzzles, and anagrams.
- Works with almost any CP/M®, CP/M-86® or MS/DOS (1.0, 1.1 and 2.0) compatible word processing program (WordStar, Magic Wand (PeachText), Spellbinder, Perfect Writer, Select, Final Word, Volkswriter, . . . and more!).

Punctuation & Style takes the worry out of writing by automatically catching dozens of different punctuation errors, both common and obscure. In addition, P&S catches unpaired format commands (underline, boldface, etc.), doubled words, and more.

P&S gives you a "critique" of your writing, suggesting alternatives for commonly misused or over-worked phrases. It also shows where active voice can replace passive voice to add clarity and precision.

Punctuation & Style is the perfect companion to The WORD Plus. It works easily with most CP/M word processors. (Available soon for CP/M-86 and MS/DOS.)

Call or write for complete information: 619-222-1153

OASIS SYSTEMS
2765 Reynard Way
San Diego, CA 92103

Circle number 8 on the reader service card.

Dealers contact:
SOFTWARE DISTRIBUTORS
1-800-252-4024 (in California)
1-800-421-0814 (outside California)

CP/M and CP/M-86 are registered trademarks of Digital Research, Inc.

FOG

The **F**IRST **O**SBORNE **G**ROUP **(FOG)** has been formed as a User's Group for persons using or interested in portable computers and/or the CP/M disk operating system with related software. In September of 1983, there was over 5400 members from around the world. Most attend local group meetings at over 300 locations.

Computer systems owned or used by members include the Osborne 1 (single and double density), the Osborne Executive 1, all models of the Morrow MicroDecision, the Zorba, all models of the KayPro, several MicroMates, and many more. Special interest groups organized to augment a network of local group meetings include dBase II, Ham radio operators, Personal Pearl.

FOG was started in October of 1981 by a small band of early buyers of the Osborne 1. The primary purpose was to organize a library of public domain software to run on the Osborne 1. A newsletter was quickly started to act as a focal point for the group's activities. The large number of excellent contributions to both the library and the newsletter has produced a library of 111 disk (as of August 1, 1983) and a nicely typeset (24 or more pages) newsletter which is published monthly. All back issues of the ***FOGHORN*** are available for a nominal fee which includes shipping in the U.S. Contributions are currently being solicited for a bulletin board system which we hope to have in operation in the fall of 1983. It will accept both 300 and 1200 baud calls.

While the meetings are organized on a local basis, many of these local groups are joining the FOG network, thus increasing the sharing of information, tips, problems and so on. Those local groups which opt to formally join the FOG network receive a portion of local member dues to assist with the cost of maintaining a local copy of the disk library.

The FOG library is currently maintained on the Osborne 1 single density format but separate libraries are being established for the other computer formats. The library files are carefully screened and divided into category types (utilities, games, applications, and computer languages are the four major categories). Programs which contain run or other errors are put into the hacker section so interested members can fix them and resubmit for inclusion in the correct section. Items which do not fit into one of these categories are in the miscellaneous section. A catalog and descriptions of all the discs is maintained in the library section.

Dues in FOG are $24.00 per year. This entitles each member to a copy of the ***FOGHORN*** each month as well as access to the disk library. Local group meetings are open to the public without charge although most restrict access to the library to the membership. The FOG library contains only public domain software. Piracy (the copying of proprietary software) is strongly condemned.

In the United States, the ***FOGHORN*** is normally mailed by non-profit bulk mail. (FOG is a corporation in the state of California and has obtained its non-profit, tax exempt status from both the state and federal governments.) For those members who live out of the country or who prefer first class delivery of their ***FOGHORN***, additional postage must be added to the annual dues. See the chart below for details.

If you are interested in joining a self-help organization to increase you knowledge and the use of your computer, use the application below (or a copy of it). Generally, memberships received at the FOG office prior to the 15th of the month are entered in time to receive the next month's ***FOGHORN***.

If you know of a local group which might be interested in joining the FOG network, please send all details (meeting dates and places, officers, and how interested local computer owners can join). We will send you an information packet on becoming an Affiliated Member Organization.

For your records, the address of FOG is P. O. Box 3474, Daly City, CA, 94015-0474. Please allow at least two months for the arrival of your first ***FOGHORN*** since bulk mail can take as much as nine weeks. (The post office says that it should only take about three week for non-profit bulk mail but some members on the East Coast have experienced longer delays.) A membership card will be processed within a week of the receipt of your dues.

ADDITIONAL POSTAL CHARGE CHART

Please add the appropriate amount to your dues payment.

Canada & Mexico (First Class Airmail delivery)	ADD...$ 6.00
Members with U.S. addresses who prefer First Class delivery to bulk mail	ADD...$ 6.00
Central & South America, Caribbean, & Europe (Airmail First Class delivery)	ADD...$12.00
Asia, Africa, & Far East (Airmail First Class)	ADD...$15.00
Out of North America preferring surface mail — delivery not guaranteed	ADD...$ 6.00

CUT HERE

NAME: _____

COMPANY: _____

ADDRESS: _____

CITY: _____

STATE: _____ ZIP or MAIL CODE: _____ COUNTRY: _____

HOME & WORK PHONES: _____

MEMBER OF WHICH LOCAL GROUP? _____

COMPUTER TYPE? _____

MODEM TYPE? _____ PRINTER TYPE? _____

INTERESTS? _____

Send this completed application **AND** your payment to:

FIRST OSBORNE GROUP
P. O. Box 3474
Daly City, CA 94015-0474
United States of America
Phone: (415) 755-4140

Be sure to include any required postage surcharge.
Your membership card will be sent by 1st class mail.

UG7

Circle number 5 on the reader service card.

User's Guide

User's Guide **Volume 2, Number 7**

February 1984

User's Guide , ISSN 0745-4791, is published six times a year by TUG, Inc., Box 3050, Stanford, CA 94305. Second-class postage paid at Redwood City, CA 94063 (USPS 689-550).

Entire contents Copyright © 1984 by TUG, Inc. All rights reserved. Reproduction of material appearing in *User's Guide* is forbidden without explicit permission. Send all reprint requests to Reprints, User's Guide, Box 3050, Stanford, CA 94305.

SUBSCRIPTION INFORMATION:
Single copy price $4.00 ($5.50 foreign or U.S. first-class, $10 foreign airmail). Subscription for six issues (one year) is:

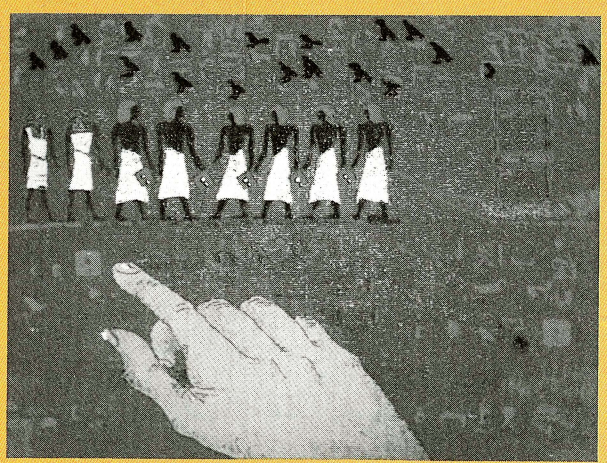
U.S. — $18 if payment accompanies order, $21 if subscription is billed (second class). Add $10 for first-class delivery.

CANADA & MEXICO — $22 in U.S. currency, payment must accompany order (second class). $32 for first-class delivery.

FOREIGN — $40 for air mail subscription. Payment (U.S. currency) must accompany foreign orders.

Inquiries about bulk, retail sale, and group rates are encouraged. Address inquiries to Circulation Dept., *User's Guide*, Box 3050, Stanford, CA 94305. Allow 6-8 weeks for processing of order.

POSTMASTER: Please send address changes (Form 3579) to User's Guide, Box 3050, Stanford CA 94305.



About the Cover

This issue's cover is a computer-generated image using an Apple II and a graphics tablet connected to the Vectrix graphics computer, by Gregory MacNicol.

It depicts Egyptian hieroglyphics (recently discovered by scientists) representing a major trading event such as a trade show. In the hands of the traders are what look like floppy disks. Also, the symbols on the walls are very similar to our present day programming flow chart symbols. Is it also coincidence that the tomb under which this was found looks very much like a VLSI (very large scale integrated) circuit pattern? Too bad the Library of Alexandria burned before it could be stored in data bases...

Contents...

PUBLISHER'S STATEMENT...
Advertising **4**

EDITORIAL...
Another New Bandwagon **5**
AT&T threatens to make UNIX the operating system of 1984.

FOR STARTERS...
A Brief Tour of CP/M **6**
A brief summary of the CP/M family systems.

OVERVIEWS

MS-DOS and PC-DOS Overview, Part One **7**
An introduction to the MS-DOS operating system (PC-DOS on the IBM PC) from a CP/M user's point of view.
by Steve Rosenthal

The DEC Rainbow **50**
An eight/sixteen-bit computer from Digital Equipment Corp.
by Tony Bove & Cheryl Rhodes

CP/M is a registered trademark of Digital Research, Inc. IBM is a registered trademark of International Business Machines. WordStar is a trademark of MicroPro, Intl. Perfect Writer is a trademark of Perfect Software. MS-DOS is a trademark of Microsoft. Rainbow is a trademark of Digital Equipment Corp. Punctuation & Style is a trademark of Oasis Systems. T/Maker III is a trademark of the T/Maker Company.
User's Guide and Impatient User's Guide are trademarks of TUG, Inc.
User's Guide (TUG, Inc.) is not affiliated with Digital Research or any hardware or software manufacturer or distributor.

TUTORIALS

Using CP/M Plus, Part Two: Utilities For Automation **25**
Using the SETDEF, SUBMIT, GET and PUT utilities to automate repetitive system operations and do special tricks.
by Mike Iannamico

T/Maker III: An Integrated Text Processor and Table Maker **30**
This package brings together word processing, table computing, bar chart graphics and list processing.
by Tony Bove & Cheryl Rhodes

FILEBASE For Personal Computers **12**
An inexpensive, easy-to-use data management system designed and optimized for use with low-capacity floppy disk systems.
by Tony Bove & Cheryl Rhodes

APPLICATION NOTE

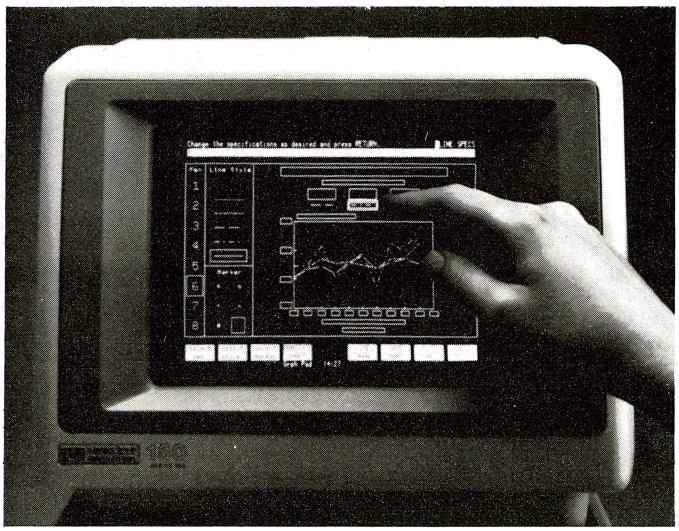
Proportional Printing With Perfect Writer **63**
Quick and easy steps to make Perfect Writer print proportional-spaced characters perfectly.
by Thomas Howe

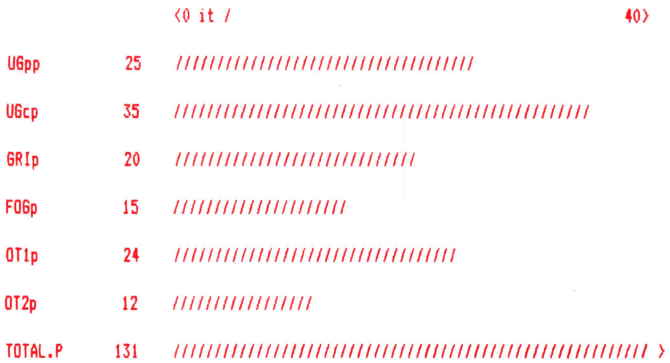
PRODUCT ANNOUNCEMENTS **56**
Systems, software, peripherals...

LETTERS **22**

ADVERTISER INDEX **55**

User groups! Take advantage of our money-saving subscription offers! Write to User Group Subs, User's Guide, P.O. Box 3050, Stanford, CA 94305.





SPECIAL

Port of Call: Making Connections (Part 2) **17**
Make the right connections with the right cables. A series on connecting computers and devices for data communications and transfer.
by Steve Rosenthal

Annual Index: Issues 1 Through 6 **68**

ARTICLE REPRINTS AVAILABLE

User's Guide is copyrighted. You must obtain **written** permission to reprint or copy articles. All requests must be in writing. Include with your reprint request the issue date, volume and number, page number(s), title and author. Send all reprint requests to Reprints, User's Guide, Box 3050, Stanford, CA 94305.

Advertising

It is an economic fact of life in publishing that advertising revenues or lack thereof determines the health of a magazine. As editors we have worked hard to provide the extraordinarily-useful content (some say "intensely useful") of *User's Guide*, but as publishers with a small organization, we have until now neglected advertising sales, largely because we are not sales oriented.

We are a small and efficient organization that knows how to produce "intensely useful" editorial content. We have now grown in sophistication by our association with Jay Eisenberg, our new representative for advertising space sales. Jay also maintains a tight and efficient operation, and provides more services to a publisher than any other representative. We are confident that our working relationship will be a profitable one.

Computer industry advertisers are more sophisticated, and it takes a sophisticated sales force like JE Publishers' Representatives to sell them. At the same time, the market is flooded with magazines from large and small publishers, and readers are being more selective. We have discovered that *User's Guide* provides excellent exposure for advertisers whose products are forgotten amidst the hype and splendor of large computer magazines.

One misunderstanding that needs to be made clear is the nature of the software products described and advertised in this magazine. Because we started as a "CP/M magazine," some media buyers think we do not cover the IBM PC. Nothing could be further from the truth. We cover software for the IBM PC; in fact, our WordStar and dBASE II tutorials are the preferred ones for use with the IBM PC. We have simply avoided the unnecessary promotional hype that appears in many PC-specific magazines.

We cover IBM PC software in these pages, but we don't limit our coverage to IBM PC versions. There are over one million existing CP/M users that use the same software. It didn't make sense to ignore them like so many other magazines do.

IBM PC computers run the same software that is available for CP/M systems: WordStar, dBASE II, SuperCalc, Multiplan, etc. We are CP/M users who are upgrading our equipment to run PC software, and using CP/M systems to communicate and share data with IBM PCs. Since PC-DOS and MS-DOS were closely modeled on CP/M, the operating environments are very similar.

It makes sense to cover both the IBM PC and other CP/M computers (the PC also runs CP/M-86 and Concurrent CP/M). And it makes sense to advertise in a magazine that is written and produced for the *users* of these systems. And without further ado...

EDITORIAL	Tony Bove & Cheryl Rhodes (chief editors), Steve Rosenthal, Kelly Smith (contributing editors)
ART	Lon Shoemaker (cartoons), Paul Winternitz (photos)
PRODUCTION	Carol Hartung, Lon Shoemaker
CIRCULATION	William Shoemaker, Kathy Slusser
ADMINISTRATION	Carol Hartung Special Thanks: Tom Howe, Mike Iannamico, Eugene Wulsin.
ADVERTISING	Jay Eisenberg, JE Publisher's Representative Company (213) 467-2266 (See advertiser index page for information.)

© 1984 TUG, Inc., *User's Guide* vol 2.1 no. 7

Another New Bandwagon

AT&T threatens to make UNIX the operating system of 1984.

UNIX is the buzzword for 1984. Why UNIX? Technological considerations aside, AT&T will probably spend millions of dollars marketing a line of UNIX business systems. That seems reason enough in an industry dominated by a few large manufacturers and dependent on communications networks controlled by AT&T.

Somehow it seems appropriate for a word like "UNIX" (pronounced "younicks") to become popular in the year of Big Brother. Recalling the *newspeak* of Orwell's *1984*, we have witnessed the re-definition of many words in computerdom, and in fact the re-definition of the entire marketplace.

The microcomputer industry is now called the *pc industry* thanks to IBM. "Compatibility" implied 100 percent in 1983; now it simply states a recognition of a trend toward similarity with the IBM PC. "Concurrency" has replaced "multi-tasking," "transportable" has replaced "portable," and Kaypro has replaced Osborne.

As all eyes turn towards communications, AT&T is almost ready to unrap its new line of personal computers based on the UNIX operating system. UNIX has been around a long time, and has always been the system of choice for scientists and researchers in universities and labs across the country. Whether or not UNIX is a "good" or "bad" operating system, history is doomed to repeat itself, and we're in for another major industry shakeup.

When MS-DOS was heralded as the standard for sixteen-bit systems, the industry media began to espouse a theory that CP/M was dead (ignoring the existence of approximately 1.5 million users of the operating system). As a result, hardly any new software products were announced for the eight-bit CP/M world. It is hard to imagine what would happen if the media heralded UNIX as the next standard, replacing MS-DOS.

Not that the media is irresponsible, although some industry people have voiced the opinion that the media is biased towards IBM, Microsoft and other large media advertisers. Irresponsible media hype, if it exists, may have only added icing to IBM's cake. One fact contributed greatly to the success of MS-DOS over CP/M: the general misunderstanding that MS-DOS compatibility meant PC-DOS (and IBM PC) compatibility.

As IBM waltzed away like the pied piper with every major software firm in tow, computer manufacturers tried desperately to become new wheels on the IBM PC bandwagon. Unfortunately for them, IBM designed the axles of this bandwagon to support other wheels for only a short time; the long term strategy is to lead everybody into proprietary IBM mainframe land, where the word "compatible" never means 100 percent.

John Dvorak, *InfoWorld* columnist, summed up "operating system compatibility" as yesterday's useless trend, and that the industry has reached a new level where hardware compatibility with IBM is the most important factor of any product. This is true today, but a new line of AT&T computers, competing against a lower-priced Apple Lisa and the new Apple Macintosh, should change IBM's hegemony over hardware and bring us back to an innovative hardware world supported by well-designed universally-compatible software.

What makes it possible to run the same excellent software package on the IBM PC, the Lisa, the Macintosh, and the new line of AT&T computers? If the package is written in the C language (the language of choice for many system programmers), which is tightly coupled to the UNIX environment, the package could theoretically run in any machine running UNIX. Any differences would occur in screen graphics, but could be resolved by using the Digital Research GSX graphics standard window environment (rumored to be part of DRI's version of UNIX soon to be available) or Microsoft's Windows (already announced, and to be made available for Xenix, Microsoft's version of UNIX).

Of course, when IBM announces *its* version of UNIX, all bets are off until we can determine AT&T's strategy. There are so many versions of UNIX that compatibility between them may never be achieved. Nevertheless, it promises to be a uproarious and entertaining bandwagon.

CP/M-80 •
CP/M-86 •
PC-DOS •
MS-DOS •

A Brief Tour of CP/M

For those who missed our first issue, here's a brief summary of CP/M systems. For PC-DOS and MS-DOS, see the overview article in this issue.

At the top of each article covering a software product, we put the above system designators CP/M-80, CP/M-86, MS-DOS and PC-DOS, to represent the operating systems for which the product is available. These systems define areas of the personal computer market which together occupy the largest chunk of the business and professional segment.

CP/M-80 (we include CP/M Plus in this category) runs on the less expensive eight-bit computers and on last year's brand new eight-bit computers. The vast majority of business application software was first designed for CP/M-80 systems and is still available for these systems.

CP/M-86 (including Concurrent CP/M-86) runs on the newest sixteen-bit computers and provides the a CP/M-80-like environment.

MS-DOS runs on the newest sixteen-bit computers and is fast becoming the most popular system for these computers. PC-DOS is a version of MS-DOS particular to the IBM PC. Nearly every new software package produced today is available to run under PC-DOS (but not necessarily MS-DOS).

There are other systems that will soon appear in this designated "system area" starting each article: MP/M II (a multi-user version of CP/M-80), MP/M-86 (a multi-user version of CP/M-86), and CP/M-68K (for computers based on the 16/32-bit 68000 processor).

CP/M-80

"Regular" CP/M, also known as CP/M-80, was designed for computers using the 8080, 8085 or Z80 processors, and was quickly established as the standard operating system for these processors.

Many derivative systems are based on CP/M-80, including SDOS and TPM. The operating environments of the first version MS-DOS (and IBM's PC-DOS) look very much like CP/M-80.

CP/M-80 version 2.2 is the current version of "regular" CP/M, and version 3.0 is a new version called CP/M Plus. Version 2.2 has several enhancements that require changes to some programs written for earlier versions. Most eight-bit computers run CP/M-80 version 2.2 or CP/M Plus.

CP/M-80 is usually tailored to specific machines. The Osborne 1 version, for example, does not work on a Kaypro; however, programs written for CP/M, and data used on CP/M systems, could be used by both the Osborne and Kaypro.

CP/M version 3.0, also known as CP/M Plus, is available on some of the newest eight-bit computers. CP/M Plus lets you add more memory to an eight-bit system to make disk operations much faster and to run larger programs.

The eight-bit processors are limited in the amount of internal memory they can manage. The limit is 64 kilobytes, which is suitable for most single-user business applications.

There is a method for adding internal memory to an eight-bit system called *memory bank switching*, in order to have more than 64K available to run larger programs, or to speed up disk operations.

If you intend to add memory to raise the amount above 64K, you need a system that can manage the bank switching method of operation. CP/M Plus was created to handle bank switching, and to provide new utilities (not found in regular CP/M) to keep time and date information about your files, and to use passwords protect files and disks from unauthorized use.

MP/M II and CP/Net

MP/M (Multi-Programming Monitor control program) is a multiple-user version of CP/M for microcomputers. The first version of MP/M was a slow but useful multi-user system. Several performance problems were ironed out, and the second version (MP/M II) gained in popularity.

To have more than one user on a computer, you need a system that can divide the processor time into slices available to each user. Memory requirements vary with the applications you are considering, but generally you need enough memory

Continued on page 60

© 1984 TUG, Inc., *User's Guide* vol 2.1 no. 7

MS-DOS and PC-DOS Overview, Part One

An introduction to the MS-DOS operating system (PC-DOS on the IBM PC) from a CP/M user's point of view.

by Steve Rosenthal

© 1983 Steve Rosenthal

Whether you like it or hate it, you can't ignore it — software developers are picking PC-DOS or the generic MS-DOS as the first choice of operating systems for most of their small computer business and home programs. With an increasing number of add-on processor boards for eight-bit computers coming onto the market, no matter what popular computer you have now, chances are you'll be able to add an 8088 board and run MS-DOS as well the system you are now running.

That's not to say that CP/M and other operating systems are dead, nor that there won't be any new software for them. One of the striking trends in software development is to write new programs in a machine-independent computer language such as C. After the program is implemented and debugged on one machine, a much smaller effort is then needed to port it over to a new operating system or machine.

It's also true that the Intel 8086 family is not guaranteed to win out in the long run. Other 16-bit and 32-bit processors have technical advantages, and even IBM has started putting the 68000 processor on its more powerful PC models. However, since software developers consider the number of software buyers to be important, for the next few years we should see an increasing amount of 8086-family software, most likely for MS-DOS and PC-DOS.

CP/M Users: You've Got a Head Start

Actually, CP/M, MS-DOS, and PC/DOS are all closely related. The original MS-DOS was a "reverse-engineered" version of eight-bit CP/M version 2.2, rewritten for use with the 8086 (16-bit) processor. The current MS-DOS is the polished and extended version of that system. PC-DOS is the version of MS-DOS customized for the IBM Personal Computer.

IBM is a registered trademark of International Business Machines. MS-DOS is a trademark of Microsoft. CP/M is a registered trademark of Digital Research, Inc.

If you're already familiar with CP/M, you'll find MS-DOS and PC-DOS very similar, especially at the user level. In fact, if you only use the operating system as a "socket" for "plugging in" store-bought programs, you may not even notice the difference.

However, if you write your own software or even if you set up your own disks, you'll find that there are some very important differences. As with most areas of computer use, small differences are important.

SBT BUSINESS
APPLICATION PRODUCTS
dBASE II

ACCOUNTING SOFTWARE

SOURCE CODE INCLUDED

All programs are provided with the source code and written in dBASE II for easy modification and operation on any personal computer which runs dBASE II. Available in RunTime.

.dPURCHASE II/.dPAYABLES II are modifiable menu-driven programs for Purchasing, Accounts Payable, and Inventory Control with up to 65,000 Vendors and Inventory Items. Prints Vendor and Inventory labels, Aged Cash Requirements, Vendor Check Register, Vendor Checks, and Purchase Order Status by Item, Vendor, and Buyer.
.dPURCHASE II $195/.dPAYABLES II $295

.dINVOICE II/.dSTATEMENTS II modifiable menu-driven programs access up to 65,000 Customer and Inventory Records, and maintain all detail for sales analysis. Automatic credit limit check and inventory update during Invoicing. Prints Customer Mailing labels and Inventory Stock labels, Sales Analysis, Back-order Report, Inventory Reorder Report, Aged Statements, Aged Trial Balance, and Cash Receipts Register for Open Item Accounts Receivable.
.dINVOICE II $195/.dSTATEMENTS II $95

.dLEDGER II modifiable General ledger for up to 65,000 user defined account/sub-account/department combinations with MTD/YTD consolidated and individual department operating statements. Balance Sheets and Operating Statements compare budgeted and actual results for any periods. Automatic distribution of single entries to multiple accounts based on user defined percentages.
.dLEDGER II $395

Learn dBASE II Application Programming! Ask about our training tapes or seminars. Call us about these and other new dBASE II products under development.

sbt CORPORATION

SBT Corporation
Small Business Technology
1140 Mountain View-Alviso Road
Sunnyvale, California 94089
Telephone 408/980-8880

*dBASE II is a registered trademark of **Ashton-Tate.**

The dBASE II Specialists

Circle 10 on the reader service card.

Note:
PC-DOS is so close to MS-DOS that, from here on, I'll mention PC-DOS only where it is different from MS-DOS. When only MS-DOS is mentioned, you can assume that the point also applies to PC-DOS. However, a point made about PC-DOS does not necessarily hold for MS-DOS.

A Quick Overview

The principal task of MS-DOS, as with any other disk operating system, is to respond to requests from the user to load programs, and then get and store data as requested by the program. From the outside, all the casual user sees is how the system displays prompts for input and how it responds to input. Programmers, however, must also worry about how their software interacts with the system.

If you start up MS-DOS or PC-DOS with a standard system disk, what you see on the screen is the usual command-level referred to as the "user interface." This part of the operating system displays the prompts, accepts commands from the keyboard, and then starts internal operations or programs as required.

The user interface is one area where MS-DOS and CP/M are most similar. Because MS-DOS was originally designed to be a smooth transition from CP/M, a good deal of effort went into making it operate in the same way despite the change in authors and hardware. So from the outside, MS-DOS's command line looks very much like CP/M.

On MS-DOS, the prompt is a letter and colon (A:) rather than CP/M's letter and right angle bracket (A⟩). The prompt serves a similar double function: it tells you the system is waiting for your input, and it also shows you what disk will be assumed when a disk name is needed but not supplied.

The answer MS-DOS expects at the prompt is a valid command line. This line must start with a command word, which can followed by inputs, parameters and options where appropriate. As with CP/M, a command word in MS-DOS can be the name of one of the built-in commands, or it can be the name of a program.

File names are the same as in CP/M — an optional disk specifier with a colon, up to eight letters for the name portion, up to three for the extension. When a command accepts multiple files, the ? and * function as "wildcards" just like in CP/M.

Also as in CP/M, the built-in commands are short utility programs that you probably will use quite often. In addition to TYPE, RENAME, ERASE, and DIR, MS-DOS has other commands. They'll be discussed in more detail in a future installment.

You can request the execution of three different types of program files in MS-DOS. The first is the familiar ".COM" file — programs that are stored in machine language form, ready to be loaded into memory and run. MS-DOS also allows the ".EXE" type file, which holds programs in relocatable code form. If you're a CP/M Plus or MP/M user, you may recognize ".EXE" files as close relatives of the ".RSX" page relocatable form. And last, there are ".BAT" files, similar in both form and function to ".SUB" files in CP/M.

Some short utilities for MS-DOS are written as ".COM" files. Most longer programs, including most application programs, come in ".EXE" form. The ".BAT" files are used both by the system for initialization and by programmers and casual users to save time and effort.

The System and System Disks

Under CP/M, the first few tracks of any disk are reserved for a copy of the operating system. If you fill up a newly-initialized disk with files, you still won't overwrite the system area. So every disk used with CP/M is a potential system disk.

Until version 3 CP/M automatically assumed that the disk in the A drive contained a copy of the system — which it proceeded to read and execute following every warm start (including after the end of every program). If, by chance, you put a disk in A that did not

© 1984 TUG, Inc., *User's Guide* vol 2.1 no. 7

have a copy of the system in the reserved area, CP/M proceeded to execute whatever it found instead, at best crashing harmlessly and at worst erasing or overwriting your disks.

Also, in CP/M versions up through 2.2 it is difficult to use a non-system disk in the A drive, because any time the system detects that a disk has been changed, it marks the disk read-only. If you then try to write on it, the system aborts your program, giving you the BDOS ERR: R/O message.

MS-DOS handles the situation differently. Rather than reserve a space exclusively for the system, the only requirement is that if the system is present, it should be the first two entries in the directory and the first area on the disk. If you don't want to use the disk as a system disk, you can instead allocate the area for normal program and data files.

With MS-DOS, if the first area on the disk is not claimed by the system before the first data or program file is written to the disk, the disk can never be a system disk. If you change your mind, you have to copy the files to a disk with the system already on it.

However, omitting the system on an MS-DOS disk is usually not a problem. Since you don't have to do a warm boot (Control-*C*) when you change disks at the prompt, you can put a program disk without a copy of the system in any drive, including the A drive, and execute programs that read and write to the disk without worrying about the system marking the disk read-only.

Furthermore, when you finish with your program and attempt to go back to the system, MS-DOS checks to see whether the files it needs are present — and if not, it stops and asks you to change disks rather than going off into never-never land (CP/M Plus has a similar feature).

Another important difference is that the only file MS-DOS needs to read from a disk at warm start is its standard COMMAND.COM (like CP/M's CCP). If you are using disks on more than one MS-DOS system, you don't have to worry about which disk has which system, since the system-dependent parts are read only on a complete cold boot or re-start.

Batch Files

In both CP/M and MS-DOS, "batch" files are text (readable) files containing lines that should be executed just as if they had been typed directly from the keyboard. You can use batch files to make up "scripts" for your repetitive jobs. Batch files are particularly useful for regular backup routines to copy your essential data each session.

Both CP/M and MS-DOS allow execution-time substitutions in the list of batch file commands, so you can write general routines and then specify new files and parameters each time you run the batch file. MS-DOS also allows batch files to print remarks and pause for inputs. In MS-DOS version 2, the batch facility also has commands for repeating, looping, testing equality, and conditional execution.

Using batch operations is much easier in MS-DOS, and more accessible to the casual user. Instead of having to process batch files through a separate program (as CP/M does with SUBMIT), batch files in MS-DOS are executed just like any other program. To run one, you simply answer the prompt with the name of a suitable file that has the ".BAT" extension.

One ".BAT" file gets special attention in MS-DOS: if there is a file named AUTOEXEC.BAT on the disk, it is executed immediately following a cold boot or complete restart. This makes it possible to order initialization routines, or make system disks that start up applications programs right away, or have each disk start up displaying a directory.

If you don't have an AUTOEXEC.BAT file on your disk, the system settles for asking you the current date and time. If you have a real-time clock, you can call upon it to set the system clock during an AUTOEXEC file, and the presence of the AUTOEXEC file will keep you from being asked again.

Overall Organization

Following the pattern set by CP/M (which in turn was based on systems

File LOG

At last — a utility to help you keep track of all those files on your busy system!

FOR EACH FILE LOGGED you will have a record of:

- date of creation
- date & time of last update
- your comments (up to 96 char.)

A MUST FOR:

- Programmers
- Spreadsheet users
- Word processors
- Anyone who continuously creates and updates files

LOG IS FAST AND EASY TO USE.

That's important because you wouldn't use a file logging tool which isn't convenient.

LOG traps errors and shows the results of your commands.

LOG FEATURES:

- catalog entry & maintenance
- sorted catalog displayed or printed
- consolidated multi-disk catalog
- can be customized to use your hardware calendar/clock

All this for only **$29.95,** prepaid.

Ohio residents add 6% sales tax.

LOG is furnished on 8" SSSD disks for CP/M-80 and CP/M-86. Inquire about other media. MS-DOS version available soon.

COMPUTER THAUMATURGY, INC.

"What we do with computers is magic!"

1212 Miami Valley Tower
40 West Fourth Street
Dayton, OH 45402
(513) 229-8871

CP/M-80 and CP/M-86 are registered trademarks of Digital Research, Inc. MS-DOS is a registered trademark of Microsoft, Inc.

Circle 3 on the reader service card.

that came still earlier), MS-DOS is constructed as a series of functional layers. There's the hardware interface, the system kernel, the user interface, and the utilities.

Interfacing MS-DOS to the hardware is comparable to doing the same job for CP/M — something best left to the hardware manufacturer or a dedicated hacker. In both cases, the interface specifications are clear and detailed, so the process is relatively straightforward. From the casual user point of view, this level of the system is invisible.

Unfortunately, Microsoft did not add any graphics specifications to MS-DOS. As with CP/M, the system assumes that all output is done with a plain, character-oriented terminal. Even PC-DOS theoretically makes this assumption — however almost all programs that are written for the PC bypass the character output routines and use the ROM or hardware for their graphics display. This is what makes these programs IBM-dependent, and why they won't run on MS-DOS machines with different ROMs and displays.

Microsoft is now offering its Windows package as the fix for this oversight, and Digital Research is offering GSX for CP/M-86 systems. Both products are intended to provide the standard graphics interface that the operating systems omitted.

The *kernel* is the part of the system that performs most of the work. It handles requests for services such as reading or writing disk files and talking with the console. Although it cannot run by itself, it is often called the DOS (Disk Operating System).

One of the design goals carried over to MS-DOS from the eight-bit version of CP/M has been to make the DOS part of the operating system work the same way on any brand or type of computer on which it can be installed. So the DOS part is made to be the same for every machine, with all the machine-specific parts of the operating system separated out into a separate section (the input/output module).

For the casual user, this level of the system shows up only occasionally, because MS-DOS includes more error detection and recovery than CP/M, most of which is provided by the kernel. For example, it is the kernel that responds to a disk error by asking whether to retry, abort or ignore the error.

For programmers, the kernel supplies available system services, and defines the logical environment in which programs run. As in CP/M, programs running under MS-DOS request services by setting registers and then calling a central entry. MS-DOS, however, does have more than one entry point.

The services provided under version 1 through 1.1 of MS-DOS are deliberately as close to CP/M as possible. This was done to make it easy to convert existing CP/M-80 programs to MS-DOS. Version 2 of MS-DOS keeps these functions for compatibility, but has now expanded into new territory.

Command Line

The most important part of the user interface in MS-DOS is the command processor, COMMAND.COM. Like CP/M's CCP, this part of the system is written as a program that is kept on disk and read in when needed.

As previously mentioned, the essential syntax of the command line has been retained in MS-DOS. But there have been a few changes. The most important, for the casual user, is that a file copy function has been added to the list of built-in commands.

COPY works somewhat like the file copy function provided on CP/M by PIP, only without the backwards syntax. To copy a file, you simply type *COPY OLD.FIL NEW.FIL* and press Return.

The resident directory function has also been expanded. When you asked for a DIR, along with the names of the files you also get their size and the date and time they were written.

Utilities

Although a large percentage of MS-DOS systems are bought by users who don't do their own programming, the utilities provided with the system still reflect the family origins as a support system for assembly-language programmers. You get one or more versions of Microsoft BASIC, but you also get a half dozen programs that the average casual user may never start up.

The contents of a distribution disk vary slightly from manufacturer to manufacturer, but in general you get BASIC, the line editor EDLIN, some kind of FORMAT program for initializing disks, the DISKCOPY and DISKCOMP utilities for making backup copies of whole disks, CHKDSK for testing directories, and the DEBUG program for machine-language debugging.

The standard Microsoft BASIC for the 8086 market is presently GWBASIC, which essential is the same as BASICA (advanced BASIC) on the IBM. Because it includes an extensive set of graphics commands, it must be customized for each hardware family. The version sold with the IBM makes extensive use of routines in the IBM PC ROMs, so it is internally quite different than the version supplied for IBM compatibles, but both operate the same way at the user level.

The EDLIN editor is perhaps the only product that actually makes CP/M's ED look like a reasonable system resource. It is there strictly to give you a rudimentary facility for making ".BAT" files and writing out your order for a more serious editing program.

Formatting, copying disks, and checking to see if the two disks are the same are all simple operations. The CHKDSK utility does not actually check the entire disk, but only the directory and file allocation table areas.

A Breather

MS-DOS may not be as exciting as you hoped it would be, so we'll take a breather from this exhaustive overview. Next time we'll take a more detailed look at MS-DOS files. Unfortunately the file structure was one design not copied from CP/M to MS-DOS. Had it been copied, we would be able to freely transfer data files from one system to another. We'll show this new file structure in a future installment.

© 1984 TUG, Inc., *User's Guide* vol 2.1 no. 7

Changing Disks

One of the striking differences between MS-DOS and the versions of CP/M up through 2.2 is how the systems react to disk changes.

CP/M was originally written for a social and technical climate where changing disks represented a dangerous practice that was to be actively discouraged. Microcomputer systems were still relatively expensive and rare, and in many situations several people had to share one machine.

Consequently, in many situations CP/M (versions up through 2.2) assumes that if it finds a changed disk between warm starts, something drastic has gone wrong. In response, the system marks your disk temporarily as "read-only," and possibly crashes your program.

The technical facilities exist to cope with disk changes (there is a system call exactly for this purpose), but the general anti-disk switching attitude somehow prevailed.

On the other hand, MS-DOS, written more than half a dozen years later, is deliberately more forgiving. Since the 8086 and 8088 processors theoretically allow for programs up to a megabyte large, and memory has become sufficiently affordable that many machines have as much space in RAM as on a disk, MS-DOS was written with the knowledge that disk changes would be necessary and desirable.

CP/M has also evolved in its changing disk attitude. CP/M Plus (CP/M version 3) lets you switch disks too.

The Return of JCL, or Ontogeny Recapitulates Phylogeny

One of the major differences between version 1 of PC-DOS and version 2 is the greatly increased power of the batch command facility. In version 1, the batch facility was very much like CP/M's SUBMIT command — it let you substitute a file of commands rather than type the commands in succession at the keyboard.

In version 2 the Batch command has evolved into a minor programming language of its own. It has a repeat facility, branching, a primitive loop and stepping mechanism, and conditional testing. As a result, you can now find programs *written entirely as BATCH command files.*

Version 2 also adds a string of environment-setting initialization procedures (notably the CONFIG.SYS file), including the ability to patch device drivers during system load. The expectation is that you won't personally write most of these procedures, however — the CONFIG system relies on manufacturers, dealers or consultants supplying you with the appropriate code.

If you talk to casual users of large IBM mainframe systems of the 60's, ask them what they thought of "JCL." This Job Control Language was the BATCH command of punched card batch processing. Like BATCH, JCL took on more and more configuration duties, evolved with features that made it like a programming language, and retreated further and further from mortal comprehensibility. And if you made a single error in your JCL cards, the rest of your program probably wouldn't even get a chance to run.

BATCH isn't this bad yet. But if you use BATCH files extensively, watch for the warning signals. You may start using BATCH only for those simple timesavers, but unless you're careful, you too could eventually become proud of writing programs that nobody would imagine could be done in a language nobody is able to understand.

ACTIVE TRACE

"A marvelous Basic programming aid . . .

It's just amazing to watch a program you wrote run under Scope, and debugging becomes if not trivial, then at least doable."

Thomas Bonoma, *Microcomputing* Dec. '83, p 22

"Extremely useful program . . . Anyone doing much programming in Basic should appreciate Active Trace a lot."

Jerry Pournelle, *Byte Magazine* April '83, p 234

Spaghetti code is what many "experts" call a beginner's Basic program which is all tangled up and difficult to follow. The **Active Trace** package will help you learn how to avoid the pitfalls of structureless programs. And if you already have a program which is too confusing to follow, or has an error which is hiding, relax. **Active Trace** doesn't get confused. **Active Trace** will lead you through your program letting you know variable values (all variables or just those you specify) as they change. In a form a novice can understand, your program's internal activity is presented on your screen, or printer, or it can be saved on disk.

For more advanced programmers, the disk file of your programs activity can be used with your word processor to automatically find the source of an error and display the circumstances surrounding its occurrence.

Ready to Order?
Just have a Question?
Contact your dealer or call
Toll Free: 800-358-9120(US)
800-862-4948(CA)

Active Trace **$79.95**
Complete package includes Scope, XREF mapping and documentation

Scope Separately **$49.95**
Only recommended for those who already own professional mapping (XREF) programs

Active Trace is available for most **MS-DOS** and **CPM 2.2** systems and supports the special features of Brand specific versions of Microsoft Basic such as **Basica** on the **IBM-PC**.

AWARECO
Active Software
P.O. Box 695 Gualala, CA 95445
(707) 884-4019

Active trace, Active software, AWARECO and Scope are trademarks of A Ware Company—CPM is a trademark of Digital Research—MS-DOS and Microsoft are trademarks of Microsoft Corporation—IBM-PC is a trademark of IBM Corp.

Circle 1 on the reader service card.

FILEBASE for Personal Computers

An inexpensive, easy-to-use data management system designed and optimized for use with low-capacity floppy disk systems.

by Tony Bove & Cheryl Rhodes

If you have an Osborne One, Kaypro II, Apple II or IIe (with CP/M) or similar computer, with two five-inch floppy disk drives, the idea of buying an expensive data base management system may seem ridiculous. Where do you store the data (assuming you haven't the luxury of a hard disk)?

Having only floppy disk drives is like using a compact car to move all the furniture in an apartment building. You need a moving van, it's that simple. The analogy is similar because furniture usually takes up more space than it should, and such is also true of data records in most "relational data base management systems."

However, personal computer users have data management needs, even if they don't have as much data as a business or profession, and don't have a hard disk, which is necessary for most data management systems. "Personal filing programs" are available,some are not as flexible as they sound.

For someone who has access to a large computerized data base and has a personal computer at home, the perfect data manager would be one that could easily handle records downloaded from the big data base system, and manipulate the data into a format that is useful on the home computer.

What is needed is a low-cost data base manager that is flexible enough to manipulate data records from other sources. This would let personal computer users manipulate data retrieved from larger computer systems.

FILEBASE is such a program. It is so flexible that at first it seems overwhelming (this may be caused by the manual and the frequent updates with additional features). FILEBASE is, however, a data base manager that is easy to use.

FILEBASE (EWDP Software, Indianapolis, IN) is priced at $75 and is available for PC-DOS and CP/M systems and in many formats (including Osborne One). It creates and manipulates data using the popular standard MailMerge® data format (data items separated by commas within records).

(MailMerge is the optional "overlay module" for WordStar® that lets you print personalized form letters, mailing labels, and any kind of reports and listings, drawing data from a data base file in the MailMerge format. You design the form letters, labels, reports and listings using WordStar.)

FILEBASE's advantages over other data base managers (besides its incredibly low price) are its flexibility in dealing with variable-length records, in producing files that are subsets of the original data base, and in selecting records for the subsets or for printing, as well as its complete compatibility with MailMerge.

For example, we used FILEBASE to select records from a dBASE II data base, print selected records quickly on paper or on mailing labels, and prepare a "personalized form letter" to use with the data. FILEBASE record selection is simple and easy to use; and the file produced by FILEBASE works well with a MailMerge form letter.

FILEBASE was designed to work with files created by it-

Typesetting Conventions

Throughout this article we use *THIS typeface* to show exactly what you should type at your keyboard, with the special symbols ↑ for the Control key (CTRL, CNTL or ALT on some keyboards), and ↵ for the Return key (RET, CR or Carriage Return on some keyboards). We also use This Typeface to show messages displayed by the system or by programs.

© 1984 TUG, Inc., *User's Guide* vol 2.1 no. 7

self or by other data base management systems that output data in the MailMerge format. Examples are dBASE II®, FMS-80®, R:base®, DataStar® and InfoStar®.

Starting FILEBASE

Starting FILEBASE is as easy as typing its name. FILEBASE requires no installation other than copying the program files to your system disk (they occupy less than 100K).

In any two-drive system you would use a system disk in drive A with a data disk in drive B. When running FILEBASE, you'd put a system disk with the FILEBASE program files in drive A, and a data disk in drive B. If you prepared data for use with MailMerge, you would simply substitute a WordStar/MailMerge system disk in drive A for the FILEBASE system disk.

From CP/M or DOS, type *FILEBASE* and press your Return key. FILEBASE starts with a copyright notice and a message telling you to go ahead and switch data disks if you need to. This message appears again and again after data operations, letting you switch disks as much as you need to. Switching disks lets you extend a data base beyond one file and one disk. If you're using double-density floppy disks you may not need to switch disks as often as with single-density disks.

```
INSERT/CHANGE data DISKS AND ⟨RETURN⟩
NO CHANGE = ⟨RETURN⟩— — — — — — — ===⟩
```

Press Return to move on to the main menu, shown in figure 1. FILEBASE provides nine operations. The usual *create a file* and *append to a file* operations let you define prompts for data entry and store the prompts in a special file for use with other data bases. The current revision (version 1.1) allows up to 40 fields in a record.

The first three operations on the main menu (figure 1) are for producing a subset or sorted data file from one or more existing data base files:

- Sorting a data base using any field in the record as the key, in ascending or descending order. Two data bases can be merged and sorted into a new file.
- Selecting records for individual printing or copying to a new file, or excluding records from printing or from a new file, by testing the contents of any field. A second data base can be merged with the first for selecting/excluding records.
- Sorting selecting/excluding as described above.

FILEBASE offers a listing operation that lets you print or display specified fields of records in one or two data bases (a second one can be merged with the first).

FILEBASE also offers a function that can add a new field to each record of an existing data base file and store the expanded records in a new file.

You can copy selected fields from a data base to a new file, forming a subset of the data base. You can also update a data base that has fixed-length records (most data base management systems use fixed-length records in data files).

The ability to copy selected fields from a large data base to a new FILEBASE file, and to add a new field to each record of the new FILEBASE file, makes it possible to perform the electronic mail application described later in this article.

Creating a File

The first step in any data base management system is to create a file and define its structure in terms of records and data fields.

FILEBASE is different because it can create a file by selecting records and data fields from a larger data base. In other words, you can create a FILEBASE file in two ways: by defining its structure and entering data using FILEBASE create and append options, or by copying selected fields from a data base.

To create a file from scratch, select operation *6* from the main menu (figure 1). This operation starts by asking:

```
(6-Create File- )
NAME OF FILE to CREATE ————===⟩ test1↩
```

FILEBASE does not let you specify a filename without a disk drive letter and colon:

```
⟨DESIGNATE DISK DRIVE with FILE NAME⟩
NAME OF FILE to CREATE ————===⟩ a:test1↩
```

The CREATE operation then asks for the number of data fields to include in each record:

```
NUMBER OF FIELDS DESIRED ————===⟩ 15↩
```

Next, the CREATE operation asks for the name of a file holding *prompts* (messages) used to prompt a data entry typist for the correct data for each field. FILEBASE lets you store prompts you created for a data base in a file to be used when creating another data base (even if the fields are different).

For now, press Return, since you have not yet set up a prompt file:

```
ENTER FILE NAME THAT HAS PROMPTS FOR THIS FILE
IF NO PROMPT FILE THEN ⟨RETURN⟩ ==⟩ ↩
```

The program moves on to the next task — defining the prompts to be used during data entry to identify the data fields. FILEBASE displays a numbered list of the data fields in the record, and asks for the number of the field to define a prompt for, or the actual prompt message for field number 1. In the following example we type the prompt for field number 1:

```
********* INITIAL FILEBASE OPTIONS **************
*  1 - SORT only (no select/exclude)              *
*  2 - SELECT/EXCLUDE only (no sort)              *
*  3 - SORT with SELECT/EXCLUDE                   *
*  4 - LIST Record #'S&FIELDS to Screen/Printer   *
*  5 - ADD new FIELDS to a FILE and OUTPUT        *
*      the expanded records to a NEW FILE         *
*  6 - CREATE a new FILE                          *
*  7 - APPEND DATA to an EXISTING FILE            *
*  8 - WRITE a SUBSET of FIELDS to a NEW FILE     *
*  9 - UPDATE a FIXED LENGTH Records FILE         *
*************************************************
SELECT (1-9) or <0>uit program ===> 6
```

Figure 1. *FILEBASE® main menu. FILEBASE creates and manipulates files with records having up to 40 data fields separated by commas (Mail Merge® format).*

```
(6-Create File-a:test1 )
 1)
 2)
 3)
 4)
 5)
 6)
 7)
 8)
 9)
10)
11)
12)
13)
14)
15)

PROMPT FOR #1 OR # TO CHANGE -===> Last Name↵
```

After typing this prompt, FILEBASE re-displays the numbered fields with the prompt message for number 1 inserted in the display:

```
(6-Create File-a:test1 )
 1)..Last Name
 2)
 3)
 4)
 5)
 6)
 7)
 8)
 9)
10)
11)
12)
13)
14)
15)
PROMPT FOR # 2 OR # TO CHANGE -===>
```

Define each prompt as you would like them to appear during the data entry process. As the typist finishes entering the data for each record, the record is re-displayed with field numbers for referring to fields. This gives the typist the opportunity to change or correct the data in any field before saving the record in the file.

Records stored in the newly-created file have fields separated (*delimited*) by commas. In other words, each field is separated from the next by a comma. Quotation marks are used only to enclose fields that have embedded commas or semicolons. FILEBASE adheres strictly to the MailMerge rules for comma-delimited fields.

This storage techniques saves a lot of disk space (although records formatted this way are variable in length and therefore harder to update from another program). For example, the size of a data base with 1000 records and ten field strings in each record could be up to 20K smaller when stored in the FILEBASE format.

Keep in mind that FILEBASE's strength is its ability to prepare data records for various reports and other uses, such as electronic mail and personalized form letters. It is not the intention of FILEBASE to provide an alternative data entry, update or append operation for users of an existing data base management system, although these operations exist in FILEBASE for users who have no need for a large data base management system. For those who have such a large system, FILEBASE provides a way to make the data accessible to MailMerge form letters, electronic mail services and other specialized reports, printouts or output options.

Using an Existing Data Base

A data base must be in the MailMerge comma-delimited format before you can use it with FILEBASE. To prepare a dBASE II data base for use with FILEBASE, use the dBASE II COPY command with the *DELIMITED WITH* , phrase, to copy the data base to a new file:

.USE FRIENDS↵
(dBASE II command to open the data base file.)

© 1984 TUG, Inc., *User's Guide* vol 2.1 no. 7

.COPY TO FR.DAT DELIMITED WITH , ↩

(dBASE II command to copy records to a new file, called FR.DAT, using the comma-delimited format.)

We copied our FRIENDS.DBF data base (dBASE II format) to the file FR.DAT in comma-delimited format for use with FILEBASE. With FR.DAT in this format, FILEBASE can tell where each field begins and ends. Also, the processing we do with FILEBASE does not affect the data base file used with dBASE II.

Other data base management systems can output data in the comma-delimited format by selecting an option, or by defining a report that simply prints each field followed by a comma (no comma at the end of the last field). However, you must be careful to output single quote marks around any field that includes a comma as a data item.

Selecting/Excluding Records

To select records for printing or for including in a subset file, or to exclude records from printing or from a subfile, use the select/exclude operation (with or without sorting — we explain sorting next).

After choosing an operation from the main menu in figure 1, you must define the disk drive to use for temporary work files, the name of the file to process in the operation, and the name of any file to add to the process (you can thereby combine two similar files and process them at once). You also decide whether or not you want to be able to change disks to save the result on another disk.

You are then asked for the name of the output file — the file to receive the result of the operation. If you type the name of an existing file, FILEBASE reminds you to use a name that doesn't already exist (the resulting file is always a new one, so that the input file (or files) remains unchanged.

FILEBASE lets you select or exclude in three ways: by testing a field in each record, by examining each record "interactively," or by selecting a range or list of record numbers.

In field tests you can use greater-than, less-than, "between-two-values" and "equal-to" comparison operations. Another option within field test is to enter a list of values to test against data in a field; for example, we could enter a list of states for the state field, or zipcodes for the zipcode field, to select only records that have those states or zipcodes.

You can view each record "interactively" and decide to select or exclude the record with one keystroke. This option is useful if there is no particular test you can define to select or exclude records. For example, to select from our FR.DAT file those friends who live in the area (to invite to a party), we would most likely test for records within a zipcode range. However, to select friends from all over the country for a special mailing (such as Christmas cards), it would be harder to devise a test — we would use the interactive mode to select only records we want (or exclude ones we don't want).

One of the best features of FILEBASE is its ability to select or exclude records by record number — that is, if you have a list of specific record numbers, or a range of record numbers, you can select or exclude them in one easy operation.

Finally you are able to specify a second output file to receive *excluded* records (selected records are stored in the first output file you specified).

Sorting Records

FILEBASE lets you sort on any field in the record in ascending or descending numeric or character (ASCII) order. You can even sort on last names embedded within whole name fields, and on zipcodes embedded in address fields.

To illustrate the difference between numeric and character sorting, suppose you had the following part numbers:

122100
1201
1225

If these were sorted in ascending numeric order, you would get:

1201
1225
122100

If these numbers were sorted in ascending character (ASCII) order, you would get:

1201
12100
1225

Character sorts disregard the *numeric value* of an entry and simply compare ASCII character codes starting from the leftmost position. This sorting process makes it easy to sort words alphabetically.

If you are sorting by character, FILEBASE also lets you choose the number of characters to use in comparing fields for sorting. Of course the more characters you use to compare, the more time it takes to perform the sort.

Writing a Subset To a New File

Another useful application of FILEBASE is to create a subset data base of fields from an existing data base. For example, we created a subset data base of our FR.DAT data base that included only the first and last name fields and the address, city, state and zipcode fields, for use with an electronic mail service.

When you choose the "write a subset" operation, you provide the work drive, the input filename, and the output filename as described above (select/exclude operation).

When you create a subset file, you can also change the contents of any field. This feature is useful if you've added a

new blank field (using the "add new field" operation) to each record and you want to supply the data for that field in each record. For example, we could add a blank field to a selected group of friends who have accounts on CompuServe, and then for each friend fill in the friend's account number (electronic mailbox address) in the newly-added field.

We are preparing an application note to describe how to use FILEBASE to do electronic mail applications from dBASE II data bases, to be published in a future issue.

Printing Options

One of FILEBASE's best feature is its ability to print a record during "interactive" examining of records in the select/exclude operation. At any time you can print the record showing on your screen, in one of several formats including mailing labels.

You can also print the record as many times as you want. Another option lets you print multiple copies before returning to the select/exclude decision-making process.

The first time you request the print operation, FILEBASE asks for printer setup information — the size of your paper, the tab position, and whether or not to use page eject after each record. Without page eject, the next record is printed on the line following the current record.

In addition to the "interactive" printing capability, you can select the list operation (*4* from the main menu in figure 1) to produce a listing. When you first select the list operation and define the file, FILEBASE displays the fields on the screen for you to select for printing.

You can move through the data base record-by-record without selecting any fields, and print whatever record you see on the screen at any time (just like the "interactive" select/exclude operation). You can also select fields for printing.

For listing on the screen you can select up to three fields, which are truncated to fit on one line of a typical 80-column display. For printing you can select up to three fields for eight-inch wide paper, four fields for eleven-inch wide, and five fields for fourteen-inch wide paper. Record numbers are printed for easy reference.

Conclusion

For its price ($75), FILEBASE is the best data base management program we've seen that was designed to be useful in a low-capacity-disk machine such as an Osborne, a Kaypro or similar computer running eight-bit CP/M and using one or more floppy disk drives.

FILEBASE wins many points for being compatible with MailMerge, which fits well on personal computers, and with other data base management systems that fit well only on computers with more disk capacity. Thus FILEBASE forms a link between the two worlds, letting users take data from large data bases and manipulate that data on small personal computers.

We use FILEBASE to prepare data from a dBASE II data base for use with personalized form letters and electronic mail. We suppose that personal computer users who have access to larger data base systems would find similar uses of FILEBASE — to process a subset of a large data base on a local level.

Near press time we received an update to FILEBASE that we have not yet evaluated (we use version 1.1). The update includes indexing as part of operation *9*. The indexing technique is to form index arrays in RAM without adding any overhead to the data file itself, so that the data file is not changed.

Other added features include the ability to search for substrings in select/exclude operations, and the ability to select or exclude records during printing (operation *4*).

We are using two versions of FILEBASE: the Osborne 1 version, and an eight-inch disk version for use with any CP/M-80 system. Unlike most programs, FILEBASE needs no screen or keyboard "tailoring" for use with any CP/M-80 system.

The program is very useful for managing data on a small system. In a future issue we'll provide a more detailed application note on using it.

FILEBASE is a trademark of EWDP Software, Indianapolis IN. WordStar is a registered trademark, and MailMerge, DataStar and InfoStar are trademarks of MicroPro International, San Rafael, CA. dBASE II is a trademark of Ashton-Tate, Culver City, CA. FMS-80 is a trademark of DJR Associates. R:base is a trademark of Microrim, Inc.

At Last!

An accounting program written for business, not accountants.

If this sounds like what you've been looking for, you should try MINI-LEDGER, our single-entry program for people who want results, not complications.

- 99 user-definable payment and income codes
- Provides almost all the information needed for taxes and financial statements
- Virtually instant analysis of your cash-flow for any period from 1 to 12 months
- You don't have to be an accountant to use it

Requires: CP/M™, 64 K RAM and at least one disk drive

Formats: IBM 8″ Single-Density - Eagle - Osborne Superbrain - and many others.

Cost: $150 complete program
$ 30 manual-only with demo disk
California Customers add 6.5% sales tax

To Order: Call or Write
Paradigm Consultants
39243 Liberty St., Suite L
Fremont, CA 94538
(415) 796-0543

MINI-LEDGER

CP/M IS A Registered Trademark of Digital Research Corporation

Circle number 9 on the reader service card.

© 1984 TUG, Inc., *User's Guide* vol 2.1 no. 7

Making Connections (Part 2)

This installment tells you how to make the right connections with the right cables.

by Steve Rosenthal

(c) Steve Rosenthal 1983

This is the second part of a series on how to hook up your computer to a modem, printer or other computer. The last one in the series covered finding the right pathway, and checking for the right voltage. This installment continues with right connections and right cables.

Although it may seem that the "ordinary RS-232" connections are standard and easy to set up for your computer, you may find that it takes more than plugging the cables together to set up a functioning data exchange. Of the 25 lines used on the RS-232 connection, there is not a single line that you can assume always works as expected. The "RS" in RS232 denotes a "Recommended Standard," and many manufacturers have interpreted in their own private way.

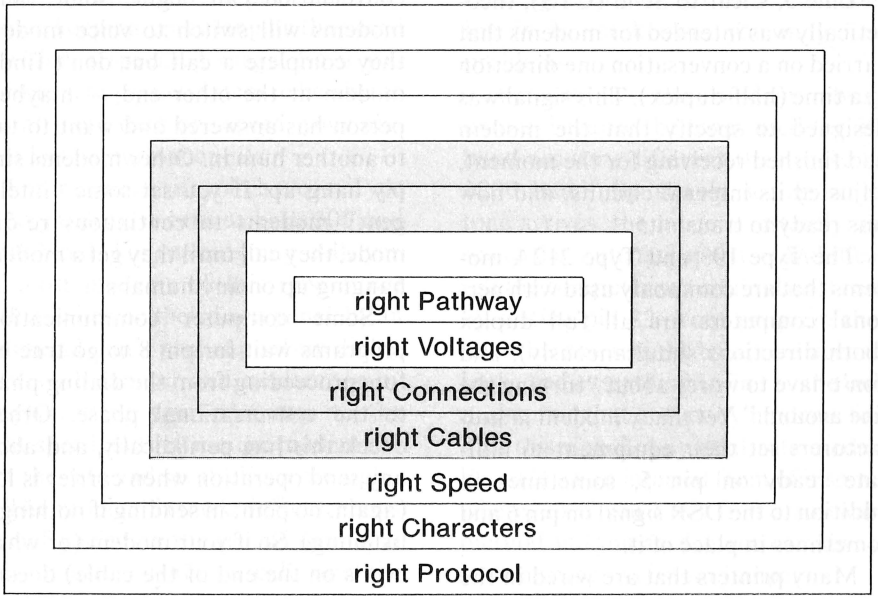
In the last installment, I wrote about how the three principal lines for serial data exchange are *data in, data out, and signal ground.* The signal ground should always be pin 7, although some manufacturers use the pin 1 position that should be reserved for safety (chassis) ground. Many systems strap pin 1 and 7 together.

The two data lines are always pin 2 and pin 3, with one of them acting as "data in" and the other "data out." If your equipment is wired like a modem (DCE mode), then pin 2 should be data out, and pin 3 data in. If your equipment is wired like a computer or terminal (DTE mode), it's the reverse — pin 2 is data in, and pin 3 is data out (see figure 1). See the last installment for how to check which one you have.

Although the standard states that modems should be wired in DCE mode and terminals and computers in DTE mode, this is not always the case. For the purpose of this article, I'll assume that a modem is wired as a modem, and that terminals and computers are wired as terminal computers (a logical assumption, not always true). So, if your equipment is wired the other way, be sure to interpret the pin numbers and signal directions accordingly.

Many systems will communicate properly if you only hook up pins 2, 3, and 7. This "three-wire" method is suitable if neither system checks for status, if the receiving system is always ready to accept another character by the time it arrives, and if the timing information is carried by the data itself.

You can usually set video terminals to work in this mode, as well as printers running at slow baud rates (slow rates of data communication), and computer-to-modem links at speeds up to 1200 baud. But sometimes even these connections take more wires.



Keeping Control

"What if," the designers of the RS-232 standard asked, "one of the two devices connected together is not ready? How is the other one to know? How does a computer know when the phone is ringing? And what happens if one

end is sending a long block of data and the other wants attention?" Their answer was to add more than a dozen status and control connections.

In some cases you can simply ignore all these other pins, and use the simple three-wire connection discussed above. But even when this works conceptually, some terminals and computers actually *do* check certain status lines, and you have to make sure they're set the right way.

Remember that RS-232 is based on negative voltage logic — a true or 1 condition is sent as a negative voltage (nominally -12 volts) and a false or 0 condition is sent as a positive voltage (nominally +12).

The most important status line is Data Terminal Ready, usually referred to as DTR. This signal goes from the terminal or computer to the modem, and says the modem can assume that the other device is wired up, turned on, and ready to go. If the modem is set to check DTR and finds DTR off, it assumes that something has happened to its paired equipment, and there is no sense in continuing to send data.

The DTR line, then, can be used in general by the device playing the non-modem role to say, "Wait — I'm not ready!" Some printers use this line to ask the computer to stop sending characters until the printer has worked off a full buffer.

Some auto-answer modems check this line before answering the phone — it makes no sense for the modem to answer if the computer is not ready to take the call. Some modems even hang up the phone if they lose DTR, since their is no point in occupying the line if there is no computer listening.

Some modems have an internal or external switch that you can set to say whether the modem should treat loss of DTR as significant. If you want to run a three-wire connection, or if the computer or terminal you're using doesn't furnish DTR, you should choose this setting that says to ignore DTR. If you don't have such a switch and your modem (or printer or computer) requires this signal, read on — later, I'll talk about how to connect up cables to substitute for any missing control signals.

Note that on some modems, using

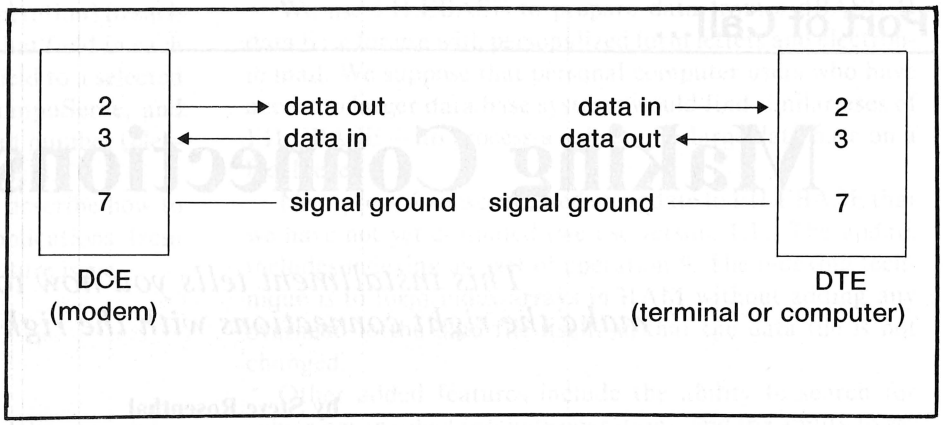


Figure 1. *The two types of RS-232 connectors: data communications equipment (DCE) and data terminal equipment (DTE).*

the DTR line is the only automatic way to signal to hang up the phone. If you sent up your connection to ignore DTR, you may have to end each call manually.

The matching control line coming the other way is pin 6, known as Dataset Ready (DSR). Dataset, of course, is one of the more formal names for communications devices like modems. But not all manufacturers use line 6 to show ready status — some use the CTS signal discussed below.

Theoretically, DSR indicates that the modem is connected, and is not busy with tests. Before the days of digital modem circuits, users of modems spent a significant amount of time testing their modems and setting various volume controls and filters. It was worth connecting up another signal line to find out whether you had left your modem in test mode.

Line 5, Clear to Send (CTS), theoretically was intended for modems that carried on a conversation one direction at a time (half-duplex). This signal was designed to specify that the modem had finished receiving for the moment, adjusted its internal circuits, and now was ready to transmit.

The Type 103 and Type 212A modems that are commonly used with personal computers are all full duplex (both directions simultaneously), and don't have to worry about "turning the line around." Yet many modem manufacturers set their equipment to indicate ready on pin 5, sometimes in addition to the DSR signal on pin 6 and sometimes in place of it.

Many printers that are wired in the modem mode use CTS (line 5) or DSR (line 6) to indicate that they are ready to accept more characters. You can also use these lines with some direct computer-to-computer links to indicate when one of the systems is ready for more data.

Is Anyone Listening?

Pin 8 carries a signal that was originally named Received Line Signal Detect, often abbreviated as LSD. It's now more often known as Data Carrier Detect, or simply Carrier Detect (CD).

This is the line that says that your modem is in contact with some other modem. This line is often used to indicate to computer or terminal placing a call that there was an answer, and the conversation can begin. Some fancy modems will switch to voice mode if they complete a call but don't find a modem at the other end — maybe a person has answered and want to talk to another human. Other modems simply hang up. If you set some "intelligent" modems to continuous re-dial mode, they call until they get a modem, hanging up on any humans.

Some computer communications programs wait for pin 8 to go true before proceeding from the dialing phase to the conversational phase. Others check this line periodically, and abort any send operation when carrier is lost (again, no point in sending if nothing is listening). So if your modem (or whatever's on the end of the cable) doesn't

© 1984 TUG, Inc., *User's Guide* vol 2.1 no. 7

Inter-Office Correspondence

SEATTLE OFFICE

Memo editor: Enter mail Mode: Add
Date: 11/30/83
Special delivery: No
From mailbox: 709 - Jack Spears Return receipt: Yes
To mailbox: 101 - Will Pierce Copies to: None
Subject: Electronic Mail Manager Attached files: No

Will,

Since the installation of the "EMM" system, our inter-office correspondance has become effective and more productive. The system is a real "bargan" at even 10 times the price! See you next week.

LYME STREET OFFICE

Memo editor: Enter mail Mode: Add
Date: 11/30/83
Special delivery: Yes
From mailbox: 101 - Will Pierce Return receipt: Yes
To mailbox: 102 - John Fail Copies to: 5 mailboxes
Subject: Board Meeting tomorrow Attached files: Yes

Hi John,

The board meeting will be held tomorrow morning at 10 A.M. This Electronic Mail Manager sure makes communications between our offices easy and fast. The new budget forcast is attached in xyCALC format. Let me know if you approve.

Made

EMM™ PLUS COMMX™

LA OFFICE

Memo editor: Enter mail Mode: Add
Date: 11/30/83
Special delivery: Yes
From mailbox: 102 - John Fail Return receipt: Yes
To mailbox: 101 - Will Pierce Copies to: None
Subject: Board Meeting tomorrow Attached files: Yes

Will,

The budget forcast looks good except that I have revised the year end projections to include new market trend figures. I have returned the new setup in xyCALC. See you at tomorrows meeting!

SOUTH STREET OFFICE

Memo editor: Enter mail Mode: Add
Date: 11/30/83
Special delivery: No
From mailbox: 908 - Lara Wilks Return receipt: Yes
To mailbox: 101 - Will Pierce Copies to: All
Subject: New Product Release Attached files: No

Will,

We have completed the integration testing of the fortran version of COMMX on the DEC 10 with links to all the micros. The error free file transfers work like a dream! The COMMX protocol does it again!

Simple

EMM™ Electronic Mail Manager using dBase II™ and COMMX™ COMMunications eXchange software team-up to provide your office personnel up to 900 mailboxes on your dial-up Inter-Office Network
Send $20 for your demo disk today! Available for all CP/M 80, CP/M 86 and MS DOS systems.

HAWKEYE GRAFIX

23914 Mobile Street, Canoga Park, CA 91306 • (213) 348-7909 or 634-0733
Modem (300 B): 634-0441 Data

Circle number 6 on the reader service card.

furnish this signal, this is another one you may have to simulate.

Switching Speeds

A modem, you'll remember, doesn't set the baud rate — the modem's job is to simply translate the pulses as they arrive, keeping up as long as the speed is within a specified range. So if you want to set up your system to be able to run at more than one speed, your modem has to know about it.

For example, if you have a Type 212A modem, it runs at both 300 and 1200 baud. For an outgoing call, you set most modems of this type either with a switch on their front panel, by an command that's part of a set-up dialog between computer and modem, or by simply setting your computer to the right speed and letting the modem detect the rate and set itself accordingly.

The problem is more difficult, however, if you're on the receiving end. If your modem answers a call, and the sendin system could be running at either 30 or 1200 baud, your computer has to set itself to the right data rate to make any sense of what arrives. If you can reliably expect a certain initial data pattern (two carriage return characters is the most often used), there are a number of methods for your computer to figure it out. But if the data coming in is not known, you may have problems.

Fortunately, the modem always knows, because the tones used for 300 baud are very different than those for 1200 baud. By simply seeing which tone arrives, the modem instantly can select the matching speed — and it can tell the computer or terminal on its end by setting pin 23. Your program then tests this pin, sets the baud rate accordingly, and everything is fine — the only problem is that not many modems furnish this signal. Any dual-rate modem has at least an internal form of it somewhere, so if you can't find a software method and you need it, you can always start putting in custom jumpers.

Less Common Controls

If you have a direct-connect modem (one that plugs into the phone line instead of connecting through an acoustic coupler), your modem may also furnish a signal on pin 22 when it detects a ring signal on the telephone line. On some modems, RI goes up and down with each ring, and stays off during the connection. On others, it stays high for the whole ringing period — and on some models, for the ring and the succeeding conversation.

Many multiuser systems use this signal as an input saying that the computer should start up the telecommunications program and raise DTR (allowing the modem to answer). Remote systems that turn the power off when not in use often use this signal for "wake-up," triggering a circuit that turns on the computer.

With the Hayes Smartmodem, you can program your computer to count rings, and answer only after a certain number of rings. You can also set up

your computer like some bulletin boards are set up — to listen for one ring, followed by no rings (caller hangs up after 1 ring), and then answer another call right afterwards. This kind of setup allows a single line to be used both for voice and data — with only an occasional mix-up when a unknowing third party calls right between the single ring and the call-back.

If you don't need any of these features, you almost always can safely leave pin 22 unconnected. If you're hooking up two computers or a computer and a printer, this line is rarely used.

Another line that you probably won't need to hook up is pin 4, Request to Send (RTS). As mentioned before, connections that can only support a conversation going one way at a time (half-duplex) need some method of alternating the direction of data flow. RTS is the signal that the computer or terminal sends to the modem saying, "Okay, it's my turn to talk." On receiving that signal, a half-duplex modem shuts off its receiver, waits a small fraction of a second for the line to stop echoing, and then starts up its own transmitter.

Telling the modem when to turn the line around is the responsibility of the terminal or computer because the modem has no way of telling when each part of the conversation is over. Until recently, most modems had no digital signal processing capabilities, and simply transformed bits into tones and the reverse. So it is left to the two more intelligent devices to agree on a set of signals for regulating the conversation — a subject that we'll take up in a future issue under "protocols."

In many situations where there is a steady stream of high speed status, there's also a need for a lower-rate way of exchanging status and control information. Of all the 25 pins, only a few connect to signals that travel over the audio phone link. You won't find this secondary channel implemented on any common personal computer modems or printers, but just for your information let me note that pin 14 is the secondary channel transmitted data, pin 16 secondary channel received data, pin 12 secondary channel carrier detect, pin 13 secondary clear to send, and pin 19 secondary request to send.

Similarly, unless you are hooking up to a big mainframe computer or directly to a large computer network, all personal computer serial connection uses asynchronous operation (where you can pause between characters without filling the gap) rather than synchronous (which sends characters at a steady rate, even if it has to fill gaps with placeholder characters). Three of the remaining pins, 15,17 and 24 are for synchronous network timing.

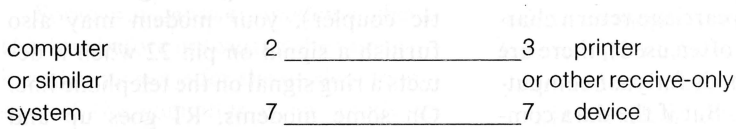


Figure 2. *A minimum one-way connection.*

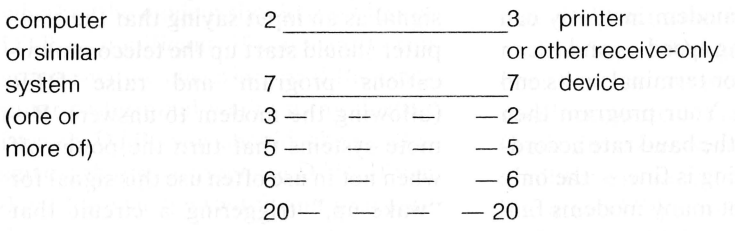


Figure 3. *Connection for a buffered printer, or printer that accepts baud rates higher than 300 baud, using CTS, DSR or DTR.*

What You Have to Connect

For a minimum, you always need to hook up pin 7, signal ground. That's the reference level that other signals are compared against, and if it is not connected then you get strange results as the momentary data pattern shifts the effective reference level.

If you're hooking up a one-way transmission, you may just need one more wire (see figure 2). If the receiving system has nothing to say and always keeps up, just ground and transmitted data might do it.

Many printers can keep up at 300 baud (30 characters per second), although you may have to add a few nulls (do-nothing characters) after each carriage return to give the printer time to get back to the beginning of the line.

If you have a buffered printer, or one that accepts higher baud rate characters but needs gaps between them, you'll probably need at least three lines. If the printer reports back its ready status on the data line (using X-ON, X-OFF or similar protocol), you need the above lines plus the data line back the other way. If it reports back on CTS, DSR or DTR, you'll need to connect that line, as in figure 3.

If you're hooking up systems that carry on two way conversations, you'll definitely need both data lines. For example, if you're sending data from computer to computer, either directly or through a modem. If all the ready signals are handled in software, or you're content to have a few data collisions, two data lines and ground are all you may need (figure 4).

If you are hooking up two devices wired as computers and terminals, both may be expecting to be talking with a modem. So instead of a straight-through cable, you'll have to add a little adapter that re-arranges the control signals to mate together (figure 5).

If your computer or modem needs status information that is not provided

© 1984 TUG, Inc., *User's Guide* vol 2.1 no. 7

on the mating pin of the other unit, you may have to simulate it. Some lines can be permanently wired to the true or false level, while others are best taken from another more common status line. On many RS-232 devices, pin 10 carries a negative 12 volt (a *true* signal), while pin 9 carries a plus 12 volt level (a *false*).

If you need DTR, and the matching unit doesn't supply it, you can simulate it with a permanent connection to a true level. Or, if your unit supplies DSR, tie pin 20 to pin 6. Similarly, if you need CTS and you have RTS, tie 4 and 5 together. Carrier detect can be connected to the appropriate DSR or DTR.

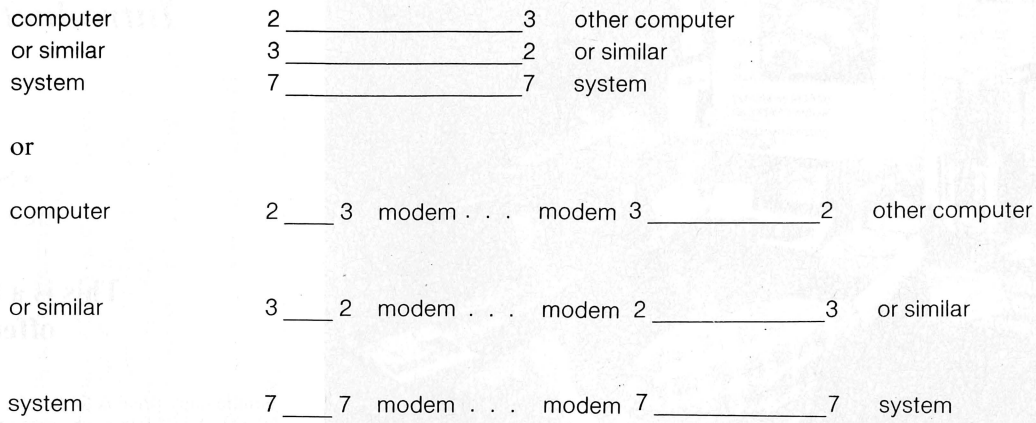


Figure 4. *Connection for two-way conversation, using two data lines.*

Next time: right speed and right characters.

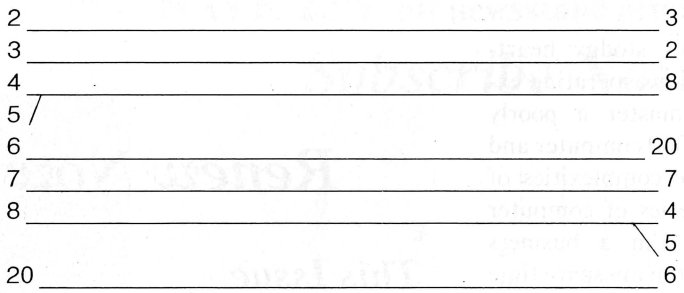


Figure 5. *Connection for two devices wired as DTE, with rearranged control signals mated together to "convince" both devices that they are "talking" to a modem (DCE).*

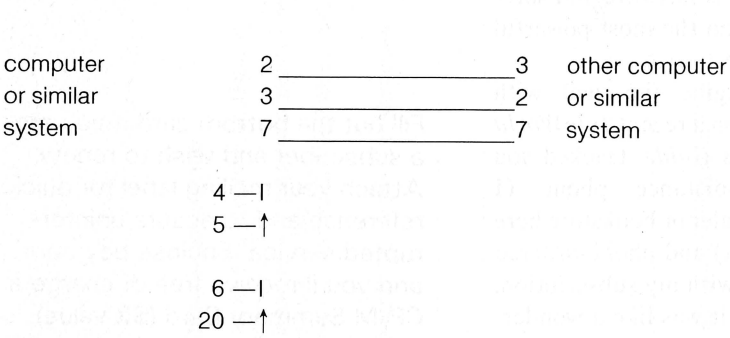


Figure 6. *A connection simulating DTR and CTS, connecting lines 4 and 5 together and 6 and 20 together.*

LYNC

COMMUNICATIONS SOFTWARE

WHY BUY 3 PROGRAMS?
LYNC HAS ALL 3 IN ONE!

1) FILE TRANSFER 2) REMOTE OPERATION
3) COMMUNICATE WITH TIME-SHARE

Easy set up on most systems.
Menu driven install program.
Command Mode of operation
Help Screen for Lync & Term

Z80 based CP/M $155
PC DOS $155 TRSDOS $75

We're Not the Biggest, Just the Best.

International Software Alliance (805) 966-3077
1835 Mission Ridge Santa Barbara, CA 93103

** DEALER AND OEM INQUIRIES INVITED **

FORMATS: 8" Standard; IBM PC DOS; TRS-80 Mod II with CP/M; VectorGraphic; Cromemco; North Star; Osborne; Xerox 820 (8" or 5"); SuperBrain; NLS KayPro; TeleVideo; TRS-80 Model I or III; Zenith/Heathkit; Victor 9000; Sanyo; Altos; Fujitsu; Otrona.

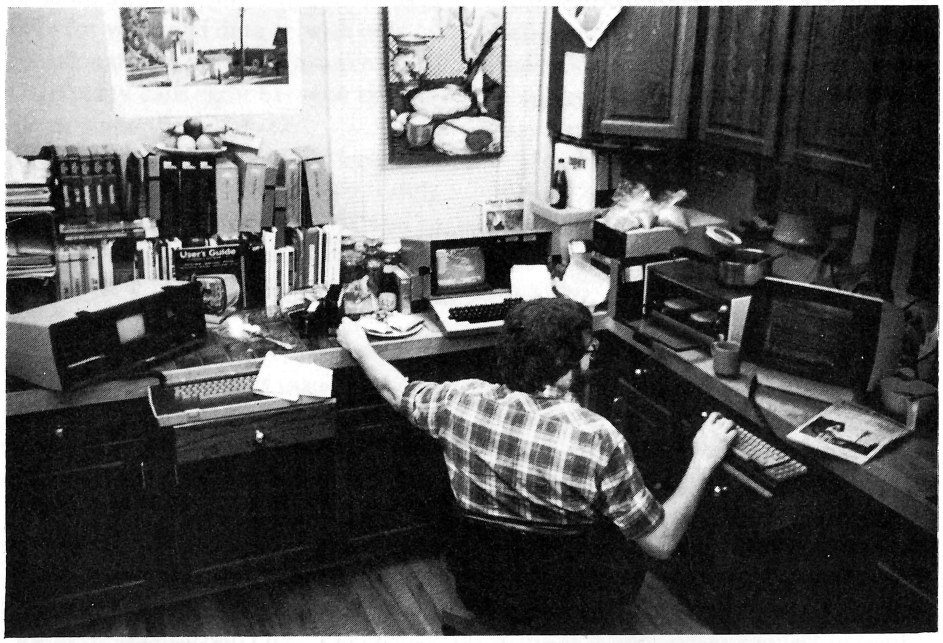
CP/M is a trademark of DIGITAL RESEARCH. LYNC is a trademark of MIDNIGHT SOFTWARE.

Circle number 7 on the reader service card.

Letters...

Question from a reader: Where's the computer on the cover of issue #6?
Answer: In the kitchen.

© Paul Winternitz



Editors:
I've just been introduced to your magazine, and I'm thrilled!

Stuart Jagoda
Columbia, MD

Editors:
...Your publication provides a real service in user education. I have the first four issues and keep them handy for reference.

Trevor Atkinson
Napa, CA

Editors:
You bet! We do want and need copy #1 of the best computer magazine . The expressions on the value of your publication in the Letter to the Editors are not strong enough. I believe the *User's Guide* should be required reading for all operators of any computer.

The writing is outstanding, the art is excellent and the tutorial articles are superior. Please don't change your proven format in the coming years of publication.

William E. Quinn
St. Petersburg, FL

Modem7: How and Where?

Editors:

Here in America's stodgy heartland, it's a lonely and exasperating experience trying to master a poorly documented Sanyo 1000 computer and PR 5500 printer, the complexities of WordStar and mysteries of computer telecommunications. I'm a business writer who's been at it in my spare time for the past two months (an advanced beginner?) with no help from a dealer who couldn't tell me how to install WordStar and tried to sell me a bootleg Sanycom program at list price. I mail-ordered a Smartmodem 300, but have no communications software and sorely need help to find the most powerful program at the best price.

You can imagine the zeal with which I pounced on a recent *InfoWorld* mention of *User's Guide*, tracked you down by long-distance phone (I couldn't find a dealer or bookstore here that knows of you) and phone-ordered issues #3 and #6 with my subscription. When they came it was like a wonderful Christmas present locked in a glass box — but the key is missing!

It's Modem7. You say it's "free, if

Continued on page 24

Subscribe Now

Don't Miss Our Low Introductory Rate:

• 12 issues
• Save 30% off newsstand price

This is a limited time offer... Act now!

Single copy price is $4.00 ($5.50 sent first-class). Add $10 to subscription price for first-class delivery.
CANADA & MEXICO: Subscriptions are $22 pre-paid.
FOREIGN: $40 U.S. dollars for six issues (air mail); payment must accompany order. Foreign back issues are $10 each (sent air mail).

Renew Now

This Issue May Be Your Last!

Don't Miss A Single Issue!

Fill out the bottom card if you are a subscriber and wish to renew. Attach your mailing label for quick reference and to ensure uninterrupted service. Enclose payment, and you'll receive free of charge a CP/M Summary Card ($2 value). Fill out the renewal card and mail it today.

© 1984 TUG, Inc., *User's Guide* vol 2.1 no. 7

Please enroll me at the low introductory offer
CHECK ONE:
☐ Send me six issues for $18, payment is enclosed, or
☐ Bill me for six issues at $21, or
☐ Send me twelve issues for $34, payment is enclosed, or
☐ Bill me for twelve issues at $40, or
☐ Foreign rates, payment enclosed: Canada & Mexico $22/six issues, overseas $40/six issues (airmail).

Payment by charge card: ☐ Visa ☐ Mastercard

Signature required: _____ Exp. date _____ MC ____

Card # _____

TOTAL ORDER: $_____

Name _____

Company _____ Title _____

Address _____

City, State, Zip _____
☐ Check if you do not want promotional mailings.

Make checks payable to: User's Guide. Offer expires 3/31/84
Subscription Dept.: P.O. Box 3050, Stanford, CA 94305.
Please allow 6-8 weeks for processing.

UG 7

SAVE 25% off newsstand price

Subscribe Now

Please enroll me at the low introductory offer
CHECK ONE:
☐ Send me six issues for $18, payment is enclosed, or
☐ Bill me for six issues at $21, or
☐ Send me twelve issues for $34, payment is enclosed, or
☐ Bill me for twelve issues at $40, or
☐ Foreign rates, payment enclosed: Canada & Mexico $22/six issues, overseas $40/six issues (airmail).

Payment by charge card: ☐ Visa ☐ Mastercard

Signature required: _____ Exp. date _____ MC ____

Card # _____

TOTAL ORDER: $_____

Name _____

Company _____ Title _____

Address _____

City, State, Zip _____
☐ Check if you do not want promotional mailings.

Make checks payable to: User's Guide. Offer expires 3/31/84
Subscription Dept.: P.O. Box 3050, Stanford, CA 94305.
Please allow 6-8 weeks for processing.

UG 7

CHECK ONE to renew your subscription:
☐ **Six issues** for $18, payment enclosed, or ☐ Bill me $21.
☐ **Twelve issues** for $34, payment enclosed, or ☐ Bill me $40.
☐ **Foreign** (pre-paid): Canada & Mexico $22/six issues, overseas $40/six issues (airmail).

Payment by charge card: ☐ Visa ☐ Mastercard

Signature required: _____ Exp. date _____ MC _____

Card # _____

TOTAL ORDER: $_____

Name _____ ATTACH _____ Label Code: _____

Company _____ YOUR _____ Title _____

Address _____ MAILING LABEL _____

City, State, Zip _____ HERE _____
☐ Check if you do not want promotional mailings.

Make checks payable to: User's Guide. Offer expires 3/31/84
Subscription Dept.: P.O. Box 3050, Stanford, CA 94305.
Please allow 6-8 weeks for processing.

UG 7

This Issue May Be Your Last!

Renew Now

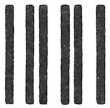
No Postage Necessary if mailed in the U.S.

BUSINESS REPLY CARD
FIRST CLASS PERMIT #36 REDWOOD CITY, CA

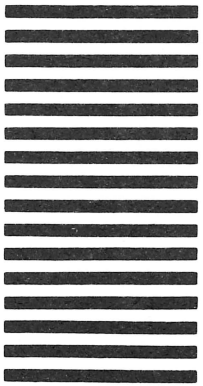
POSTAGE WILL BE PAID BY ADDRESSEE

User's Guide
P.O. BOX 3050
STANFORD, CA 94305

Billing Address:



No Postage Necessary if mailed in the U.S.



BUSINESS REPLY CARD
FIRST CLASS PERMIT #36 REDWOOD CITY, CA

POSTAGE WILL BE PAID BY ADDRESSEE

User's Guide
P.O. BOX 3050
STANFORD, CA 94305

Do You Have All Our Back Issues?

Please send me the following back issues:

Payment by charge card: ☐ Visa ☐ Mastercard Payment must accompany order.

Signature required: _____ Exp. date _____ MC _____

Card # _____

☐ CP/M Summary Card, $2 each: # of cards _____ = $_____
☐ Back issue #3, #4, #5 or #6 at $4 each ($5.50 first class or foreign surface, $10 foreign airmail), or #2 at $6 each ($7.50 first class or foreign surface, $12 airmail):

Issue# 1 Qty. _____ at $5 each ($6.50 1stC or foreign, $11 air) = $_____

Issue# 2 Qty. _____ at $6 each ($7.50 1stC or foreign, $12 air) = $_____

Issue# ___ Qty. _____ at $4 each ($5.50 1stC or foreign, $10 air) = $_____

TOTAL ORDER: $_____

Name _____

Company _____ Title _____

Address _____

City, State, Zip _____

☐ Check if you do not want promotional mailings.

Make checks payable to: User's Guide. Offer expires 3/31/84
Subscription Dept.: P.O. Box 3050, Stanford, CA 94305.
Please allow 6-8 weeks for processing.

UG 7

Billing Address:

No Postage Necessary if mailed in the U.S.

BUSINESS REPLY CARD
FIRST CLASS PERMIT #36 REDWOOD CITY, CA

POSTAGE WILL BE PAID BY ADDRESSEE

User's Guide
P.O. BOX 3050
STANFORD, CA 94305

Don't Miss A Single Issue!

Billing Address:

No Postage Necessary if mailed in the U.S.

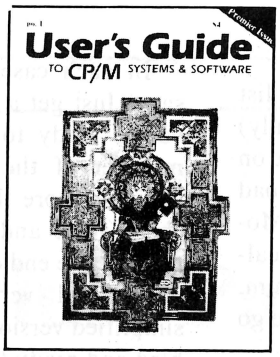
BUSINESS REPLY CARD
FIRST CLASS PERMIT #36 REDWOOD CITY, CA

POSTAGE WILL BE PAID BY ADDRESSEE

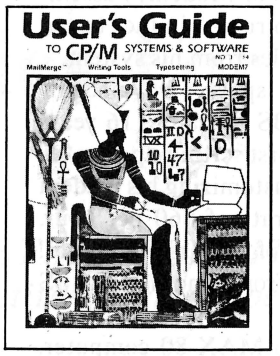
User's Guide
P.O. BOX 3050
STANFORD, CA 94305

Back Issues Are Selling Out!

Here are just a few reasons why these issues are so popular:

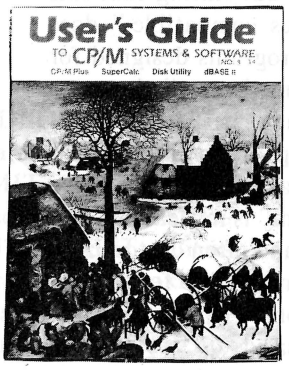


Issue #1
Learning to Use CP/M®
Impatient User's Guide® to CP/M
Using CompuServe®
Preventing Computer Disasters
System Overviews: Osborne, IBM® PC, Alspa ACI



Issue #2
For Starters: Word Processing and Spreadsheets
A Guide to Using WordStar® (Pt. 1)
Impatient User's Guide to WordStar
WordStar Installation Guide
Disk Doctor: The Rx For Bad Disks
CP/M Tutorial: Files and the Directory, Modifying Your BIOS
A Guide to Using SuperCalc® (Pt. 1)

Issue #3
For Starters: Word Processing Power
MailMerge® The WordStar Printing Robot
Impatient User's Guide to MailMerge®
Public Domain CP/M Software
Word Processing Tools for Writers (WordStar):
Using DocuMate® Plus, Footnote and Bibliography
WordStar File and Print Summary
MODEM7 Tutorial and
List of RCPM Systems



Issue #4
For Starters: Exploring dBASE II®
A Guide to SuperCalc (Pt. 2)
SuperCalc SuperSummary
Overview of CP/M Plus (CP/M 3.0)
CP/M Plus Operating Tools
Reference Guide to DU (Disk Utility)
Floppy Disks
System Overview: CompuPro 8/16

Issue #5
For Starters: Laying a Foundation
Introduction to dBASE II
Using CP/M Plus: Commands and File Utilities (Pt. 1)
dBASE II Application Note: Subscription Fulfillment
Perfect Filer Overview & Starter
CP/M Plus: Inner Workings
Hard Disks For Small Computers
System Overviews: Radio Shack Model 100, PMC MicroMate
TeleVideo 950 Terminal With the WordStar EPROM Kit
The Answer Man

☐ Back issue #3, #4, #5 or #6 at $4 each ($5.50 foreign), or #2 at $6 each ($7.50 foreign):

Issue# 2 Qty. _____ at $6 each ($7.50 foreign) = $_____

Issue# ____ Qty. _____ at $4 each ($5.50 foreign) = $_____

Sorry! Issue #1 is sold out! Thank you! **TOTAL ORDER: $**_____

Name _____

Company _____ Title _____

Address _____

City, State, Zip _____

Payment must accompany order.

Make checks payable to: User's Guide. Offer expires 3/31/84
Subscription Dept.: P.O. Box 3050, Stanford, CA 94305.
Please allow 6-8 weeks for processing.

UG7

CP/M is a registered trademark of DRI (Digital Research, Inc., Pacific Grove, CA). Concurrent CP/M is a trademark of DRI. CompuServe is a trademark of H & R Block. IBM is a registered trademark of International Business Machines. WordStar and MailMerge are trademarks of MicroPro Int. (San Rafael, CA). SuperCalc is a trademark of Sorcim Corp. (San Jose, CA). DocuMate Plus is a trademark of Orthocode Corp. (Albany, CA). dBASE II is a trademark of Ashton-Tate (Culver City, CA). Perfect Filer is a trademark of Perfect Software. Radio Shack is a trademark of Tany Corp. MicroMate is a trademark of PMC (Recortec, Sunnyvale CA).
User's Guide and Impatient User's Guide are trademarks of TUG, Inc.

Continued from page 22

you know where to find it," and you list RCPM systems (phone numbers only) that presumably can upload it to me on request. But if I were able to download from an RCPM, I wouldn't need Modem7! When I ask about it here, dealers either don't know of no local comm. program user group nor even how to go about finding one.

How and where can I, lacking a user group or the ability to go online, get a "free" copy of Modem7? What commercial programs besides COMMX and MITE offer the Modem7 protocol? Please reply in the enclosed stamped envelope. I really can't wait months to know your answers.

Thank you — for this and for *User's Guide*, a readable, refreshing oasis of much-needed CP/M help.

George Johnson
St. Louis, MO

We are tearing our hair out trying to round up all the information we need to write the last, definitive article on getting Modem7 and making it work on your system. The result of this research will be published as soon as we can typeset it. Really!

If anyone out there can help, please send any information you have to us at Modem7 Research, User's Guide, P.O. Box 3050, Stanford, CA 94305. *You can also reach us through Western Union's Easylink service (623 09240) or CompuServe (70105,722). Please do not call us directly.*

— editors

Editors:

I am well-aware that it would be impossible to ask for Modem7 customization instructions for every possible combination of computer/modem-/software, or even for the most popular. However, in every discussion I have seen of the general topics of "modeming" and "public domain software," the fact that customizing of the software will probably be necessary is not even mentioned. This has been true in your publication, in Dr. Dobbs' Journal, FOGHORN (the Osborne Users' Group newsletter), the PICONET CP/M Users' Group newsletter — etc.

In each case, one sentence might say, "Just get a copy of Modem7 and you're ready to go." I was lucky; a member of the PicoNet user group gave me more than 3 hours by phone (both voice and modem communication) at the end of which I had a fully-customized version of MDM7 (a simplified version of Modem7) assembled and ready to run — in fact tested by transferring files from his system.

In contrast, I spoke (via modem) with a local RBBS operator (16 years old) who, when first setting up, was offered "help" in customizing his modem software at the rate of $60 per hour, with an estimate of 2 hours, minimum! And this was from another RBBS operator!

I have a Lobo MAX-80 computer, and a Signalman VII modem (RS-232, Auto Answer/Auto Dial). I have never seen any reference anywhere to customizing software for either of these alone, much less this specific combination. I have seen ads stating that this modem is "Hayes compatible:" does this mean that programs designed for the Hayes Smartmodem will also operate the Signalman VII? Anyway, I think you see my point; to say that public domain software is available if you "just get a modem" is misleading; it is not that simple, and often customizing the software is impossible for the beginner; all the more so when no one told him it was necessary!

W. Duane Austin
Mtn. View, CA

When a modem is advertised as "Hayes Smartmodem-compatible," we can only assume the modem will work exactly as a substitute for the Hayes Smartmodem. If this is not so, it is a case of false advertising. We have no experience with this modem, but we would be surprised to find the modem incompatible with the Smartmodem.

We agree with your point on Modem7 customization. You were lucky. We usually point people to their local user group to get a copy of Modem7. Recently, the MDM series became available over bulletin boards, and it is now possible for people to download source code, patch it themselves, assemble the Modem7 program and go. We are planning an article that describes exactly how to do this, with pointers on how to get the specific information you need to run your modem with Modem7.

— editors

Feedback

Editors,

Enclosed please find a check to cover both a new subscription and all the currently available back issues of *User's Guide*. *User's Guide* is fantastic and fills a much needed purpose: solid, down to earth applications. I find myself wanting to copy all of the issues I see — every article! I would much rather have the issues themselves.

Alan MacDuffie
Public Citizen
Washington, DC

Your publication was reported on in the July issue of the *Portable Companion* (a former publication for Osborne computer users). Being an Osborne owner/user, I would certainly be interested in receiving your publication. However, your premiere issue was described as a basic CP/M tutorial — the basis for future issues. Therefore, I wish to subscribe only if you can furnish me that premier issue. If affirmative, please commence my subscription as soon as possible, and bill me at this address.

Al Phillips Jr.
Base-Line Systems Corp
Moorestown, NJ

Our first issue completely sold out, and by popular demand we are revising and printing a new edition of our premier issue. The new edition is $5 (second-class) or $6.50 sent first-class or surface foreign ($11.50 air mail overseas). Please send the correct amount to Issue 1 Dept., User's Guide, P.O. Box 3050, Stanford CA 94305.

— editors

Continued on page 62

© 1984 TUG, Inc., *User's Guide* vol 2.1 no. 7

Using CP/M Plus, Part Two: Utilities For Automation

Using the SETDEF, SUBMIT, GET and PUT utilities to automate repetitive system operations and do special tricks

by Mike Iannamico

© 1983 Mike Iannamico

In this article we examine the SETDEF utility that lets you define how information is searched for and how it is displayed. We also explore the SUBMIT command which makes it easy to execute repetitive or sequential CP/M Plus commands. Lastly we examine the PUT and GET utilities used to divert output and input to and from files. By taking a few moments to use these utilities you can relieve yourself of those time consuming repetitive or sequential command operations you perform on a regular basis.

Typesetting Conventions

Throughout this article we use *THIS typeface* to show exactly what you should type at your keyboard, with the special symbols ↑ for the Control key (CTRL, CNTL or ALT on some keyboards), and ↩ for the Return key (RET, CR or Carriage Return on some keyboards).

Since computer activities nearly always involve typing, you'll see *THIS typeface* used a lot to show commands, with letters in all upper case to distinguish commands from regular text. You may not have to type in upper case — we use it to emphasize commands.

We also use This Typeface to show messages displayed by the system or by programs, and to show old text in a file where new text has just been typed (new text is in *this typeface*, of course).

CP/M is a registered trademark of Digital Research, Inc. (Pacific Grove, CA).

SETDEF: Changing Search and Display Habits

When you type the name of a program or use SUBMIT, CP/M Plus searches in a predetermined order for the program or submit file in order to execute it. You can use the SETDEF utility to change the predetermined order to, for example, search in a place other than drive A, user 0. You can also use SETDEF to display information on the screen in a certain way.

Typing the command SETDEF by itself causes the SETDEF options and their current values to be displayed:

```
A>SETDEF↩

Drive Search Path:
   1st Drive            - Default
   Search Order         - COM
   Temporary Drive      - Default
   Console Page Mode    - On
   Program Name Dis-
   play                 - Off
```

Here is what each option means:

1st Drive

This determines the order in which drives are searched when you type a command. The pre-set (default) order is that only drive A is searched.

Search Order

This option specifies the type of file to be searched for when the file type (three-character filename extension following the period) is not explicitly specified in the command line. Normally, CP/M searches for the file type ".COM" when you don't specify a file type. (There are some exceptions when using utility program — for example, when using the MAC command to assemble files.)

Temporary Drive

This indicates the drive to store temporary files created during processing. By default temporary files are stored on the currently logged drive.

Console Page Mode

When ON, only 24 lines of information are displayed on the screen at a time. This feature is usually ON, and it requires that you press Return after viewing each page. When this feature is OFF the display scrolls continuously and can be halted at your discretion by typing Control-*S* (this is the usual way to halt CP/M 2.2 displays).

Program Name Display

This option is usually OFF but can be turned ON so that the name and location of each executing program is displayed on the screen.

The SETDEF command is used with its various options to alter the default settings which are normally in effect. For instance, to change the order in which the drives are searched for programs, you would type SETDEF followed by the desired search order as shown below:

A⟩*SETDEF A,B,C*↩

The drive letters must be separated by commas. You can substitute an asterisk (*) to stand for the current drive (whatever drive you are "logged into" at that time) if you so choose. After you type this form of the SETDEF command the newly specified search order is displayed on the screen.

You can also use the SETDEF command to specify on which drive temporary files are to be stored. Temporary files are created during the course of using some application programs and are usually identified by three dollar signs (.$$$) as the file type.

For example, WordStar creates a temporary file on the logged drive whenever you are editing a file. If you were short of room on the disk in the currently "logged" drive, you could have the temporary file stored on another drive. For example, to tell the system to place temporary files on the disk in Drive A, type this command:

A⟩*SETDEF [TEMPORARY=A*↩

Another use of the SETDEF command is to specify the type of file that the system should look for when you give a command to execute a program. Under default circumstances the computer will only search for files with the ".COM" file type. To alter the search order so that the system will not only look for ".COM" files but ".SUB" files as well, you would type this command:

A⟩*SETDEF [ORDER=(COM,SUB)*↩

After typing this command, the system is set to look for both ".COM" and ".SUB" files. This option is used in conjunction with the "Drive Search Path" option so that ".SUB" files do not have to be located on the default drive.

Sometimes when you give a command it is useful to have the name of the associated program file and its location displayed on the screen. This form of the SETDEF command can be used to keep track of submit files that are being executed. If you want the name and location of files displayed on the screen as they are executed, type this variation of the SETDEF command:

A⟩*SETDEF [DISPLAY*↩

Then, any time you type a command such as DATE, you will see the name and location of the file being accessed. To turn this option off, type:

A⟩*SETDEF [NO DISPLAY*↩

Finally, you can use SETDEF to turn the system page mode *off* or *on* for the CP/M Plus utilities that display more than one screen of information (for example, TYPE.COM).

When the page mode is *on* (the default setting), information is displayed one screen at a time, and you must press Return to see the next screen. When the page mode is *off*, the screen continues to scroll until you reach the end of the file or until you type a Control-*S*.

To to turn the page mode *off*, type this form of the SETDEF command:

A⟩*SETDEF [NO PAGE*↩

To turn the page mode feature back *on*, type:

A⟩*SETDEF [PAGE*↩

"Batch Processing" With the SUBMIT Utility

During normal use of CP/M Plus and application programs, you may discover that you repeatedly use some sequence of commands or programs. Rather than type each command or program name in the sequence individually, you can combine them in a text file and use SUBMIT to execute them one at a time, in the order they appear in the file.

© 1984 TUG, Inc., *User's Guide* vol 2.1 no. 7

First you create a text file with the commands and programs to execute , one on each line. You can use the ED utility or some other text editor (for example, WordStar) to create this file of commands called a *submit* file. Any valid name can be assigned to the file, but the filename must have the file type (extension) ".SUB".

For this example we use ED to create the file shown below:

```
A>ED B:MAGIC.SUB↵
    :*I↵
   1:*SETDEF [DISPLAY] ↵
   2:*DATE SET↵
   3:*INITDIR B:↵
   4:*SET B: [CREATE=ON] ↵
   5:*SET B: [UPDATE=ON] ↵
   6:*↑Z  (Control-Z)
    :*E↵  (This saves the file)
A>
```

By using MAGIC.SUB (created in the above example) you can establish the date, initialize the disk in drive B, and then enable create and update time stamping. We included the SETDEF command on the first line so that the name and location of every command executed will be shown on the screen.

To execute the submit file, first make sure the appropriate files are located where they are supposed to be, then type *SUBMIT* followed by the drive and name of the submit file, like this:

```
A>SUBMIT B:MAGIC↵
```

You can also type *SUBMIT* by itself, and SUBMIT asks for the name of the file to be executed.

Typing one SUBMIT command to prepare a new disk in drive B is easier than typing each command one at a time. You can create as many submit files as you like, each with its own name and purpose, for use in various situations.

Using Variables In The Submit File

Some repetitive activities involve different values used in the same way with commands or programs. For example, you may want to perform a sequence of commands at once, using different filenames every time you do the sequence.

With commands and program names you can also include *variables* in the submit file that reference values supplied in the SUBMIT command. This capability lets you include different values (*arguments*) each time you run SUBMIT for a particular submit file.

Use a dollar sign followed by a sequential number (*$1*, *$2*, *$3*, etc.) to denote a variable whose value you will supply in the SUBMIT command. For instance you could set up a submit file like this:

```
A>ED B:YELLOW.SUB↵
    :*I↵
   1:*DATE SET↵
   2:*INITDIR $1:↵
   3:*SET $1: [$2,$3,$4] ↵
   4:*↑Z  (Control-Z)
    :*E↵
A>
```

Using this submit file, you can specify which drive is to be formatted by INITDIR and affected by the SET commands at the time when you type the SUBMIT command. You also have the choice of supplying any one of the other options possible through the SET command.

When you SUBMIT the above submit file you need to supply the values which correspond to the variables. The first argument in the SUBMIT command replaces every occurrence of $1, the second argument replaces all occurrences of $2, and so forth. Here's an example of supplying arguments for the SUBMIT command:

```
A>SUBMIT B:YELLOW B NAME=SEA PASS=GREEN
PROT=ON↵
```

This command executes the submit file YELLOW.SUB located on drive B, and selects drive B as the drive to be affected by INITDIR and SET. The name "SEA" is passed to the submit file where it is applied as the disk name. The password "GREEN" is passed to the submit file and used as the disk password. The PROT option is also passed to the submit file to turn protection on. This sequence of commands prepares a disk for password protection in a way that cannot be tampered with.

By simply changing the arguments to the SUBMIT command you can select another drive or sequence of SET options. Once you have supplied the values for a submit file they remain associated with that file until you change them or end your session. This means that you do not have to explicitly enter the values the next time you submit that command file unless you want to use a different set of values.

Including Program Input in the Submit File

Under some circumstances you may want to include lines of input for a program to automatically execute with a submit file. Program input lines must be preceded by a less-than sign (<) as shown below in sample input lines for the PIP utility as typed into a submit file:

```
PIP↵
<B:=A:*.COM [R] ↵
<B: [g2] =A:*.DOC [A V] ↵
<↵
DIR B: [drive=all,user=all,sys] ↵
```

The three lines immediately following *PIP*↵ are input lines to the PIP program. The first line copies all of the ".COM" files (including system files) on drive A to the disk in drive B. The second line tells PIP to copy all ".DOC" files from drive A to user area 2 of drive B. The Return key typed after the less-than sign (⟨) in the third line sends a carriage return to PIP, which causes PIP to retire so that the next CP/M command can execute. Following this is a version of the DIR command that displays a directory for all files no matter which drive or user area they are located in.

If a program invoked by a submitted command requires more input than is included in the command file, the system requires you to enter the missing input from the keyboard. If the program terminates before having used all standing inputs, SUBMIT ignores the remaining input lines but displays a warning message:

```
Warning: Program input ignored
```

You can put Control-key characters in a submit file by preceding them with a caret (↑). If you ever need to enter an actual caret instead of a Control character, enter two carets, which are translated into a single caret when the submit file is processed. In the same way, double dollar signs ($$) translate into a single dollar sign ($) when the submit file is processed.

"Nested" SUBMIT Commands

You can include SUBMIT commands within a submit file and they are treated like any other CP/M Plus command. Each nested SUBMIT command has its own submit file, so several sets of submitted commands can be executed. Here is an example of how it works.

A file called COMPILE.SUB contains these commands:

```
RMAC $1
LINK $2
```

Another file called COMPALL.SUB contains these commands:

```
SUBMIT COMPILE CVOLUTIN.ASM CVOLUTIN.REL
SUBMIT COMPILE DVOLUTIN.ASM DVOLUTIN.REL
SUBMIT COMPILE EVOLUTIN.ASM EVOLUTIN.REL
DIR
```

Now we type this command:

A⟩*SUBMIT COMPALL*↵

The first command line of COMPALL.SUB is executed which in turn executes the commands in COMPILE.SUB substituting the value CVOLUTIN.ASM for the $1 and CVOLUTIN.REL for $2 in the file. Then the second line of COMPALL is read and executed, and the third. Finally, the fourth line is read, the directory is displayed on your screen, and we return to the CP/M Plus command level.

System Start-up With PROFILE.SUB

CP/M Plus automatically searches for a special submit file called PROFILE.SUB whenever the operating system is loaded into memory. You can put any commands you want in a submit file named PROFILE.SUB and have them automatically executed whenever you start the system. When a PROFILE.SUB file exists, the system executes the commands in that submit file before displaying the A⟩ prompt.

If you want to be prompted for the date and time whenever you start the system, you could create a file named PROFILE.SUB which contains the appropriate command:

```
DATE [SET
```

Each time you boot from the disk containing this PROFILE.SUB submit file, the system will ask you to establish the date and time.

You can make your PROFILE.SUB file as elaborate as you like. For instance, you can include all of the commands in the MAGIC.SUB file shown earlier. However, the file SUBMIT.COM, the submit file PROFILE.SUB, and any other utilities that are referenced in the submit file must be located on drives included in the current search path. If your computer comes with some program that already performs an autostart function, you will have to erase it in order for the PROFILE.SUB to execute, or use the command *SUBMIT PROFILE* to as the autostart command.

Saving Console or Printer Output in a File Using PUT

There are occasions when you want to save a display or the results of a print operation in a disk file. The PUT command, when activated, stores all console or printer output in a destination file of your choosing. You can activate PUT for the next program you run, or for the duration of system activity (until you type another PUT command).

The generic form for the PUT command is as follows:

```
PUT CONSOLE TO filename.typ [option,option]
PUT PRINTER TO filename.typ [option,option]
```

For example, to divert all console activity to a file named JONES, you would type this form of the PUT command:

A⟩*PUT CONSOLE TO FILE JONES.PRN*↵

Subsequently, everything displayed on the screen by the next program that runs is also saved in a file named JONES.PRN. In the same manner you can have printer output saved in a file by using this form of the PUT command:

© 1984 TUG, Inc., *User's Guide* vol 2.1 no. 7

A⟩*PUT PRINTER TO FILE JONES.DOC*↩

In this case, the output generated by the next program which ordinarily would be sent to the printer is instead stored in a file named JONES.DOC.

Several options are available with the PUT command. These options must be enclosed in square brackets and are entered immediately following the command. Here is the full set of options:

ECHO/NO ECHO

By default, output is displayed on the screen ("echoed"), but you can turn echoing off with the *NO ECHO* option.

FILTER/NO FILTER

By default, Control characters in the output are not translated to printable characters. However, the *FILTER* option filters Control characters so that they appear in the file. For example, the Escape character is translated to ↑[in the output file.

SYSTEM

This option causes all output (both system and program) to be stored in the specified file. All console and printer activity is stored in the file until you restore output to its normal destination with another PUT command.

Here is an example — type these commands in a row (assuming you have a text file named ANYFILE.DOC):

A⟩*PUT CONSOLE TO FILE JONES.BAK [NO ECHO*↩
A⟩*TYPE ANYFILE.DOC*↩

The console output from the command *TYPE ANYFILE.DOC*↩ is stored in a file named JONES.BAK. The output does not appear on the screen while it is stored to the file because the *NO ECHO* option turns off echoing. Re-direction of console output to the file ceases automatically when TYPE finishes.

Normally, output to the file begins when the next program executes, and continues until that program stops. However if you type the following command, the PUT remains in effect:

A⟩*PUT PRINTER TO FILE FILE.TYP [SYSTEM]*↩

All subsequent output to the printer is stored in FILE.TYP including system prompts and your responses. This condition continues until you re-direct the output back to its normal destination with this command:

A⟩*PUT PRINTER TO PRINTER*↩

If you use the *NO ECHO* option and the *SYSTEM* option together, you will see only a PUT⟩ prompt. Re-directing a PUT command executed with the *SYSTEM* option is possible whenever the system PUT⟩ prompt is present.

Getting Input From a File

The GET command lets you substitute text in a file for data that would normally be typed at the keyboard. This is very useful for storing commands or data to be used as the input for another program. The format of the GET command is:

GET FILE filename.typ [options]

The GET options are *[ECHO]* or *[NO ECHO]*, and *[SYSTEM]* As with the PUT command, *ECHO* turns on echoing to the display console and may be turned off with the *NO ECHO* option. The program output and the system prompts are still displayed. If you use the *SYSTEM* option, GET immediately takes console input from the specified file without waiting for you to run a program.

The following examples show how the GET command works:

A⟩*GET FILE ANSWER.FOR*↩
A⟩*ANYPROG.COM*↩

The user program ANYPROG.COM executes, taking its input from the file ANSWER.FOR. When ANYPROG terminates (or a *GET CONSOLE* command which may be embedded in the file is encountered), the system reverts to the console for further input.

To use the *SYSTEM* option type this form of the GET command:

A⟩*GET FILE ANSWER.FOR [SYSTEM]* ↩

In this example, the system immediately goes to the file ANSWER.FOR which supplies the next and all subsequent console input. If the file ANSWER.FOR contains an embedded *GET CONSOLE* command at any point in the file, control reverts to the console; otherwise, the file ANSWER.FOR provides all console input until it is exhausted.

To get input again from the console keyboard, simply type:

A⟩*GET CONSOLE*↩

With this command you are in control of the system keyboard.

The GET utility is useful for automating operations that require a different set of data. You can edit a data entry file for the new information, then use GET to send the input to the program. GET is also useful for setting up automatic logging-in to computer services such as The Source and CompuServe. The log-in entries and passwords can be hidden conveniently in a file for use with GET and the *[NOECHO]* option (so that the password is not echoed).

There are perhaps hundreds of applications involving the use of SUBMIT, PUT, GET and SETDEF (for defining the search pattern). In future issues we'll present some of the applications we do and others we've investigated.

CP/M-80 •
CP/M-86 •
PC-DOS •
MS-DOS •

T/Maker III: Integrated Text Processor and Table Maker

This package brings together word processing, table computing, bar chart graphics and list processing.

by Tony Bove & Cheryl Rhodes

Typesetting Conventions

Throughout this article we use *THIS typeface* to show exactly what you should type at your keyboard, with the special symbols ↑ for the Control key (CTRL, CNTL or ALT on some keyboards), and ↵ for the Return key (RET, CR or Carriage Return on some keyboards).

We also use *lower case* to show T/Maker III commands and options as you type them, and *UPPER CASE* to distinguish T/Maker III commands from regular text. You don't have to type in lower case or upper case — you can mix them as you please.

We use This Typeface to show messages displayed by the system or by programs, and to show old text in a file where new text has just been typed (new text is in *this typeface*, of course). Sometimes we use This typeface to show how characters look on the screen or in print (each character takes up the same space, as is the usual case with screens and printers).

There are also occassions to use special symbols. When this occurs we explain them before using them, so look for explanations nearby.

T/Maker III is a $275 program that lets you do word processing, table calculations and formula computing, list sorting and tallying, data transfer between reports, and bar graphs. T/Maker III runs on all CP/M and MS-DOS (PC-DOS) systems, including the IBM PC and XT.

We used T/Maker III to prepare a simple list of articles (with the number of typeset pages computed from the size of each article) and an expense account to keep track of business expenses. T/Maker III performed these applications very well. In fact, for its price, T/Maker III is probably the best software deal because it combines word processing, spreadsheets and simple data processing into one $275 package.

T/Maker III is manufactured by the T/Maker Company, 2115 Landings Drive, Mountain View, CA 94043.

T/Maker III is a trademark of the T/Maker Company. WordStar is a trademark of MicroPro International. SuperCalc is a trademark of Sorcim, Corp. dBASE II is a trademark of Ashton-Tate.

© 1984 TUG, Inc., *User's Guide* vol 2.1 no. 7

We also used the program to keep track of incoming response cards. We created a daily response "log" that helps our secretary keep track of responses to different promotions (each response card has a "source code" identifying the promotion). We merge daily "log" tables to form a weekly response table, from which we produce bar charts showing how successful each promotion is.

Another task was automating the entire mail collection process by creating a "mail log." This task wasn't easy, and we admit that our application is probably too complicated for T/Maker III (more suitably handled by a data base management system that captures accounting data). The first problem to appear was the problem of expanding the log to accommodate new categories of mail. How do you expand a table and still keep it compatible with previous tables that were not expanded? This would require some re-editing that a data base management system would not require.

However, T/Maker III is a suitable program to handle the task on a small scale (such as a retail business testing responses to advertising and promotion efforts). On a large scale (such as a magazine that needs to expand its testing every week), T/Maker III can help facilitate small tasks in a way that does not put an extra burden on the usual data processing activities.

T/Maker is flexible enough to combine tables, graphs and text in a single report. The tables can be recalculated repeatedly (as in "what if" spreadsheet programs), even though they are set up as ordinary text.

This flexibility lets you produce reports that would ordinarily require several programs and a data transfer effort. Managers, account executives and salespeople find T/Maker III useful for compiling reports quickly. Executives can evaluate these reports on-screen by using a simple command to convert numbers to bar charts.

Another useful application for executives (or anyone retrieving stock or investment information from an information service or another computer) is analyzing information down-loaded from a financial information service. The data is usually already arranged into rows and columns, and the simple text can be modified using the T/Maker editor into tables that can be charted into bar graphs.

The limits to T/Maker III are not too restrictive. In eight-bit CP/M-80 systems, a T/Maker file cannot be larger than 22 kilobytes, with only 300 characters per line (and a maximum of 25 columns per spreadsheet). In sixteen-bit CP/M-86, MS-DOS and PC-DOS systems, the limit to file size is 44 kilobytes with 400 characters per line (and a maximum of 50 columns per spreadsheet). Although these limits sound restrictive, we have found that our spreadsheets never reach that size, nor do our text files.

Getting Acquainted

As in most programs available for CP/M systems (which vary in display/keyboard units), some tailoring is required to customize the program for your display and keyboard. A program called TMODIFY is provided to do these and other modifications to the program. The instructions are clear and concise (*we provide a table of changes we made using TMODIFY in an accompanying box*).

To start using T/Maker III, we recommend you try the tutorial at the beginning of the manual, which shows you how to set up a simple report with a table. The tutorial constantly refers to the reference handbook for the actual commands, where you'll find spaces next to the commands to fill in your *own* commands. You can rename T/Maker's commands to be ones you are already familiar with.

We actually changed the name of *every T/Maker III editing command* to resemble WordStar editing commands. This takes a few minutes and requires some forethought, but is worth doing if you are familiar with another program's editing commands and you don't want to learn new editing commands (*see accompanying box*).

T/Maker III starts up quickly (which is an immediate advantage over WordStar, which starts up slowly and requires a filename before you actually start writing). It is therefore very useful for writing messages, memos, quick letters, messages for electronic mail, creative writing and other notes.

To start T/Maker III (assuming you have a version already customized for your computer), type its name on the command line following the CP/M or MS-DOS A) prompt:

```
A) TMAKER↵

T/MAKER Version 3.02
Copyright (c) 1982
Peter Roizen

WHAT NEXT?
```

You are immediately presented with the name of the program, the author's name, and the prompt WHAT NEXT?

What's next? Usually *editing* is the next task. You can write text immediately by typing the command *EDIT* and pressing your Return key, which puts you into *edit mode*. You can type text and save it to the file TMAKER.TXT without specifying a filename. You can rename this file from within T/Maker or by using a CP/M or MS-DOS command.

You can create a file with T/Maker using the CREATE command:

```
WHAT NEXT? CREATE↵
WHAT FILE NAME?SAMPLE.TXT↵
WHAT NEXT? EDIT↵
```

(This sequence creates the file SAMPLE.TXT and puts you into edit mode.)

In edit mode you can create a document, report, table, list or data file. The EDIT command is the universal method of writing to or changing the workspace.

The concept of "workspace" is used throughout T/Maker. You are given a "window" on an area of memory called the workspace, which is initially empty. You fill this workspace with text by typing text in edit mode. You can also fill the

workspace with a file by using the GET, INSERT or MERGE commands to bring in text from a disk file. You save the workspace text in a disk file using the SAVE command.

The Workspace File, and a Comparison to WordStar

It is important to understand how T/Maker III handles saving data from the workspace. T/Maker III remembers the filename you use to CREATE a file, or the filename used with the GET command, as the *workspace* filename. The SAVE command automatically saves the workspace text in a file using this name, overwriting any existing file by that name.

The assumption is that when you use GET to bring an existing file into the workspace, you intend to edit the file and save the edited version in the same file, replacing the old contents. Consequently, if you intend to GET a file and make changes, but save those changes in a *different* file (leaving the original file undisturbed), you must RENAME the workspace filename before using SAVE to save the workspace. RENAME only lets you create a *new* name (hence a *new file*); if you intend to save the text in an existing file by another name, you must first use DELETE to delete the existing file, then use RENAME to re-use the name for the new file.

This approach is like WordStar's — the file you create or edit is the same file that receives the edited version during a save command. T/Maker's INSERT command is like WordStar's read a file command (↑*KR*) — it brings another entire file into the workspace for editing and saving with the workspace file.

T/Maker's RENAME command has no parallel in WordStar. With RENAME you can rename the workspace filename to a new name, thereby creating a new file when you use the SAVE command. This lets you GET a file, RENAME the workspace, make changes, and SAVE the edited version in a new file. Using WordStar you would have to either (1) select for edit the existing file, make changes, mark the entire file as a block, and write the block to a new file; or (2) create a new file, read the existing file into the blank workspace, make changes, and save the edited version.

No matter how you approach the problem, you solve it in four steps. T/Maker III is easier than WordStar in *abandoning* the workspace — simply don't SAVE it. Of course, T/Maker III is more dangerous because you can easily forget to SAVE. WordStar makes saving easier because your choices to stop editing are to save and re-edit (like T/Maker's SAVE), save and go to the selection menu, save and leave WordStar, or abandon and go to the selection menu.

Unlike WordStar, T/Maker III lets you type text and numbers liberally in the same workspace and calculate rows and columns of numbers. Like WordStar the text can be anywhere and formatted for printing with every conceivable printing feature; unlike WordStar, in the same space with formatted text you can set up row and column calculations.

T/Maker III has print formatting features not found in WordStar, including repeated table headings, and footnotes printed on the same page as the reference (you can add Footnote® to WordStar to get more flexible footnote control than T/Maker's, but T/Maker's footnotes are easier to set up).

Like WordStar, T/Maker III prints page headings and footings, underlined and boldfaced words, footnotes printed on the same page they reference, etc. You can define margins and re-form paragraphs.

You can also choose to type simple text, with numbers arranged in simple rows and columns, without the fancy word processing and printing functions. The following example shows how simply you can prepare a report with a list of items, a calculation and a bar graph.

Quick Steps To Prepare a Report

For a quick example we typed our Christmas list using T/Maker III (using the TAB key to line up prices and sales tax):

Christmas List

Person	Gift	Price	Tax
Heller, D.	Tape: CLASH	2.90	0.18
Heller, L.	Book: Summer	9.95	0.64
Shoem.	Dr. John Rec	5	0.30
Hartung	Shirt	11	0.66
Slusser	Shirt	11	0.66
		TOTAL	

This example shows how a list of items with values can be summed with the ease and speed of a hand-held calculator. Reserving the first seven spaces of each line for *symbols*, and using the TAB key, you type each line item as you want it to appear.

You then add the essential ingredients to making a calculating table: an *example line* that begins with *ex* and a *calculation strip* of plus (+) signs.

ex 999.99 999.99

Christmas List

	Person	Gift	Price	Tax
+	Heller, D.	Tape: CLASH	2.90	0.18
+	Heller, L.	Book: Summer	9.95	0.64
+	Shoem.	Dr. John Rec	5	0.30
+	Hartung	Shirt	11	0.66
+	Slusser	Shirt	11	0.66
=			TOTAL	

© 1984 TUG, Inc., *User's Guide* vol 2.1 no. 7

The *ex* line uses two *999.99* examples to define the columns of the table. The *999.99* defines a column of five-digit decimal numbers including two decimal digits.

The vertical calculation strip of plus signs defines each row that contains a value, and the operation to perform on that value. Simple plus signs are for addition, and the equal sign (=) defines the row to contain the result.

With values in each row/column position (column under the *999.99* heading and row with a plus sign), you can compute the result by leaving edit mode and telling T/Maker to "compute."

To leave edit mode, type Control-*Q* (or whatever you renamed the "quit edit mode" function to). T/Maker displays the WHAT NEXT prompt, and keeps the workspace on your screen.

To save the workspace (before computing), type this command:

WHAT NEXT?*SAVE*↩

If you did not name a file, the text is saved in a file named TMAKER.TXT. If you named a file using CREATE, RENAME or GET, the text is saved in that file.

Next, move the display and the cursor to the top of the file, to view it from the beginning. Type these coordinates:

WHAT NEXT? *1/1*↩

Now you are ready to compute the table in the workspace. Type this command:

WHAT NEXT?*COMPUTE*↩

The screen should show the results. If the results are below the line of view, use the EDIT command to return to the workspace:

WHAT NEXT?*EDIT*↩

```
ex                                    999.99        999.99

     Christmas List
     Person        Gift                Price          Tax

+    Heller, D.    Tape: CLASH          2.90          0.18
+    Heller, L.    Book: Summer         9.95          0.64
+    Shoem.        Dr. John Rec         5.00          0.30
+    Hartung       Shirt               11.00          0.66
+    Slusser       Shirt               11.00          0.66

=                                      39.85          2.44
                                                 ----------
                                                   TOTAL
```

The workspace shows a computed table. Note that T/Maker automatically changes *5* to 5.00 in the column. You can type numbers as you wish *as long as the digits fall underneath the example heading.* T/Maker automatically adjusts the numbers to match the example heading.

Now try a bar chart. First, leave edit mode and type the SAVE command to save the text. Then use the RENAME command to rename the workspace to a new filename such as SAMPLE.BAR:

WHAT NEXT? *RENAME*↩
FILENAME? *SAMPLE.BAR*↩

Type the command *1/1* (followed by Return) to display the workspace from the top, then type the following command to draw a bar chart on the screen:

WHAT NEXT? *BAR*↩
VARIABLE? *Price*↩

If you typed the column name *Price* as shown in the example (under the *999.99* of the *ex* line), the following chart should appear on your screen (if it doesn't, try typing the actual coordinates of the column containing the rightmost digit).

```
Heller, D.     TAPE: CLASH        2.90 //////
                                       //////
Heller, L.     BOOK: Summer       9.95 ///////////////////////
                                       ///////////////////////
Shoem.         Dr John Rec        5.00 ///////////
                                       ///////////
Hartung, C.    Shirt             11.00 ////////////////////////
                                       ////////////////////////
Slusser, K.    Shirt             11.00 ////////////////////////
                                       ////////////////////////
```

The BAR command asks for more options. There are many options available to widen or lengthen or otherwise change the bars, or superimpose ("stack") bars from other charts, or control names of bars. Here's the simple option of replacing your workspace with the bar chart itself:

OPTION (OR END)? *REPLACE*↩

The bar chart is placed in your workspace where you can save it in the current workspace file (which you previously renamed to SAMPLE.BAR).

Type *END*↩ to leave the BAR command. Type *SAVE*↩ to save the workspace on disk.

That's it! You created a list and a table, computed a result, drew a bar chart of the data and stored everything on disk. You can print both the list/table text and the bar chart separately, or combine them in the workspace and in one report file for printing together.

```
        ARTICLES FOR USER'S GUIDE #7
        ============================

ex                                      9999                    999.99
zv                                        -                       -
uc1                                     stk                     ftk
uc2*                                                            0.20

                                          A                       B
                                         ---                     ---
        2-COLUMN ARTICLES               # of K                 # of pages
        ---------------------------------------------------------------------
+       T/MAKER III                       28                      5.60

+       MS-DOS Part 1 (Rosenthal)         18                      3.60

+       Communicat. Pt.2 (Rosenthal)      16                      3.20

+       Perfect Writer Prop. (Howe)       18                      3.60

+       CP/M Plus Pt. 2 (Iannamico)       16                      3.20

+       DEC Rainbow Overview              16                      3.20
        (not edited)
+       For Starters                       6                      1.20
        (not finished)

+       Editorial                          6                      1.20
        (not finished)

+       Letters                            6                      1.20
        (not finished)
        ---------------------------------------------------------------------
=       TOTAL                            130                     26.00
```

Figure 1. *A report of the articles to be printed, with a simple multiplication by a constant to compute the number of typeset pages equivalent to the number of kilobytes on disk occupied by each article.*

Calculations

To perform calculations in T/Maker III, you type the calculation problem as text in the workspace (use the *EDIT*↩ command to enter edit mode and type), and then leave edit mode and type the *COMPUTE*↩ command.

You can calculate down any column and across any row. COMPUTE scans the workspace row-by-row from the top of the screen to the end of the file, calculating and displaying results.

T/Maker III uses vertical *calculation strips* and horizontal *calculation lines*. We used a calculation strip in our Xmas list — the strip of plus (+) signs in the first column of the workspace. These symbols mark specific rows containing numbers to be calculated.

To create a report that will contain tables to compute, you must reserve the first seven columns of the workspace for calculation strips and line markers. Use the TAB key to skip over the first seven columns before typing text.

The manual explains in detail how to type calculations in rows and columns by comparing them to "grammar school" ways of writing arithmetic problems:

```
   1        2                          7 - 2 = 5
 + 2      x 2        or                2 x 3 = 6
   3        4                          10 / 5 = 2
```

The following examples show how you type these problems in the T/Maker workspace, using the first seven columns as a calculation strip containing the arithmetic symbols:

```
ex          9999
+              1
+              2
=
```


© 1984 TUG, Inc., *User's Guide* vol 2.1 no. 7

(The answer appears in the row containing the equal sign.)

```
ex          9999
+              2
*              2
=
```

(The asterisk is used for multiplication. The plus sign identifies the row containing the number to be multiplied.)

```
ex          9999.9
+             10
/              5
=
```

(The above example uses a different *model number* in the example line to create decimal numbers in the column.)

```
ex          9999.9    9999.9    9999.9
ac1         +         -         =
+              7         2
```

(A calculation line is defined by the model numbers in the ex line and by symbols underneath these model numbers that also reside on a line prefixed by ac1 or similar control code.)

```
ex          9999.9    9999.9    9999.9
ac1         +         /         =
+             10         5
```

Addition, subtraction, multiplication and division signs mark rows containing values to compute. The equal sign is a special *terminator symbol* that produces a result. There are many other terminator symbols that act upon the usual result to produce different results, such as the reciprocal of the usual result, the square root of the usual result, the sine or cosine, etc.

Example lines (beginning with ex in the strip) contain model numbers that define the columns to compute. The model number 9999.9 defines all numbers as having four integer digits and one decimal digit. The model number 9999 defines a column of four-digit integers. The model numbers serve a dual purpose in identifying the type of number as well as the location of the numbers in each column to be computed.

To set up a horizontal calculation, use a *control code* (such as ac1 or jc1) in the strip to mark the row containing the symbols that describe the calculation.

Figure 1 shows a worksheet with simple horizontal and vertical calculations. The first example line defines two columns: column A (9999) with four-digit integers and column B with decimal numbers (999.99). The line immediately following the example line (beginning with zv) tells T/Maker to use a dash in each column rather than 0 for a zero value.

The third and fourth lines contain *control codes*. The uc1 control code defines the first activity to perform, and the uc2 code defines the second activity (the asterisk is for defining a constant). The uc stands for "usually compute," which means compute the rows with plus signs, but *not* the rows with equal signs. The number is the order of activity — the highest number is the last activity performed and produces the last result displayed.

We use two other features of T/Maker spreadsheets: constants, and store-and-fetch variables. The asterisk following uc2 defines a row of constants to use in multiplication with rows to be calculated. We use the second column to hold the constant 0.20 (one-fifth). (There is no constant in the first column in this row.)

In order to perform the automatic multiplication to derive column B, we start with the first horizontal activity, uc1. This line *stores* the value in column A into the variable *k*, and then *fetches* the amount stored in variable *k* to place in column B. The stk expression stores the value in k, and the ftk expression fetches the value. You can use any letter for k from a to z (e.g., sta and fta, stb and ftb, etc.).

What happens with this storing and fetching is that when you type the COMPUTE command, the value typed into column A will be put into column B (which is now blank). With the value in column B, the second horizontal calculation line can be called into action.

The uc2 line multiplies whatever is in column B by 0.20 (one-fifth, an approximate ratio of kilobytes to typeset pages). Because the column A value was copied to column B with the store-and-fetch operation, this value is multiplied by 0.20, producing the result we want.

The uc code computes every row with a regular plus, minus, multiply or divide symbol. Note how we define the computable rows with plus symbols and use regular unmarked rows for explanations and text. The unmarked rows are printed but are ignored by the COMPUTE command.

```
SAMPLE EXPENSE ACCOUNT
======================

ex                                          99,999.99
        Category                                Amount
        ----------------------------------------------
+       misc supplies                            36.99
+       floppy disks                             79.01
+       misc supplies                            11.82
+       entertainment                           100.45
+       car rental                               55.23
+       air fare                                128.45
+       office rent                             650.00
+       office util                             120.20
+       car rental                               79.01
+       telephone                                82.21
+       misc supplies                            19.01
+       telephone                                75.67
+       entertainment                            82.78
+       cab fare                                 29.00
+       meals                                    50.54
+       misc supplies                            11.85
+       books & mags                             32.21
+       office rent                             650.00
+       office util                             120.20
+       car rental                               55.21
+       telephone                               128.45
+       entertainment                           100.45
+       telephone                                75.67
+       books & mags                             35.40
        ----------------------------------------------
=       TOTAL                                $ 2,809.81
```

Figure 2. *An expense account for tallying and sorting. Plus signs mark the rows to be tallied and sorted.*

```
TALLY IT 8 38 SUM 40 48 END

floppy disks      =  1    79.01
car rental        =  3   189.45
telephone         =  4   362
cab fare          =  1    29
books & mags      =  2    67.61
air fare          =  1   128.45
misc supplies     =  4    79.67
office rent       =  2  1300
office util       =  2   240.4
meals             =  1    50.54
entertainment     =  3   283.68
```

Figure 3a. *The TALLY command counts every line of the expense account in figure 2 that has a plus sign, and computes a tally that sums the amounts for each category. TALLY inserts this list in the workspace and includes a line showing the command used to generate it.*

```
TALLY IT 8 38 SUM 40 48 END

office rent       =  2  1300
telephone         =  4   362
entertainment     =  3   283.68
office util       =  2   240.4
car rental        =  3   189.45
air fare          =  1   128.45
misc supplies     =  4    79.67
floppy disks      =  1    79.01
books & mags      =  2    67.61
meals             =  1    50.54
cab fare          =  1    29
```

Figure 3b. *The result of sorting the tally in figure 3a. The list is sorted into descending order by the largest amount.*

Tallying and Sorting Lists

A good example of using T/Maker to manipulate a list is an expense account (figure 2). Define a set of category words to use to describe the expenses, and then use TALLY to summarize each category and SORT to sort them into a list showing the most expensive to the least expensive category.

With the TALLY command you can make a short list of items from a large report. TALLY counts only lines marked with mathematical symbols, which is useful for tallying items from different tables in the same report. You can also specify the *all* option for TALLY to count all lines that are not blank.

TALLY prepares a short list of items and inserts the list into your workspace above the text you are tallying. You can sum a column of numbers associated with items while tallying the items. You can also prepare the list as a data file for use with other reports or spreadsheets.

To use TALLY, create a list like the one in figure 2 in your workspace. Leave edit mode and type the command *INFO*↩ to display a number line at the top of the screen. This line tells you the number of each column, which is necessary information for using TALLY. Type the coordinates *1/1*↩ to move the screen "window" to the top of the file.

© 1984 TUG, Inc., *User's Guide* vol 2.1 no. 7

Like most T/Maker III commands with options, you can type all the options on the same line with the command, or type them one at a time as T/Maker asks for them, ending the options with *end*. To type the TALLY command as we typed it, on one line, type this:

WHAT NEXT? *tally it 8 38 sum 40 49 end*↩

Here's an explanation of the above command line, given as if you typed each by itself.

First type the command *TALLY*↩ . TALLY asks for the name of the file to be tallied. You can type *it*↩ to tally the file already in the workspace.

TALLY then asks for the left key position, followed by the right key position. The key positions define the first key used to tally the items. The key depends entirely on what column numbers you provide here.

For example, we are tallying on the category names and summing the expense amounts in each category (figure 2). We choose *8* for the left key position (the start of each category description) and *38* for the right key position (the end of the description field of each line). Press Return (↩) to enter each number.

TALLY asks for another left column position, but here we type the word *sum*↩ to have TALLY automatically add up the amounts.

TALLY now asks for a left *variable* column position. The variable is the field to use for summing. We type *40*↩ for the left and *49*↩ for the right variable column positions (corresponding to the positions of the ex 99,999.99 line).

Finally we type *end*↩ to stop typing column positions, and TALLY commences making the list. TALLY inserts the list at the beginning of your workspace. Figure 3a shows the results of our TALLY command on the expense account in figure 2. TALLY includes a line showing the command used to generate it and the results of the tally. Figure 3b shows the same list sorted into descending order by the largest amount.

TALLY produces a list that can be sorted with the SORT command. The list can also serve as a data file, with the item descriptions acting as field names to be used with the LOAD and UNLOAD data transfer commands (more on this later).

With SORT you can sort all lines in the workspace, or sort only consecutive lines starting with a line marked with a plus sign (useful for sorting tables in a report). SORT can sort the lines alphabetically by character, or by number value, in either ascending or descending order.

To sort the list in figure 3a, type the *INFO*↩ command to see a column number line, then type the following SORT command:

WHAT NEXT? *sort n d 50 59*↩

The *n* stands for numbers (rather than *c* for characters), the *d* for descending (rather than *a* for ascending), and the column numbers *50* and *59* are the boundaries of the summary amounts computed by TALLY in figure 3a. Figure 3b shows the result of doing a SORT on the list produced by TALLY.

Tracking Responses WIth a Transaction Log

T/Maker III is especially good for keeping a record of events (a *transaction record* in data processing lingo) because you can analyze the results quickly and chart them with bar graphs.

We designed an electronic "mail log" to keep track of responses to our subscription promotion campaigns to determine which campaign is showing the best results.

Figure 4 shows the blank form a typist sees. The typist enters edit mode and fills in the top row of blanks with actual daily subtotals, then leaves edit mode and types the COMPUTE command.

The ac1 horizontal calculation (figure 4) is a simple addition performed for *all* rows with mathematical or terminator symbols. Each result is placed in the TOTAL. column for the row computed.

We use the "column name" (cn) line to identify columns by short field names to be used in bar graphs. You can print a table with or without the cn line or any calculation line. Use the CLEAN command after the table is calculated to get rid of all calculation and example lines and the vertical calculation strip, to print the table without them.

The example in figure 4 also shows two simultaneous vertical calculations. You can use all seven column positions reserved for vertical strips for mathematical and terminator symbols. Each column is a single operation performed once. In figure 4, the plus signs line up with equal signs on different rows. The equal sign or other terminator symbol terminates the above operation in that column (you can start a new calculation below a terminator symbol in the same column).

The worksheet needs numbers in order to perform calculations. Type the numbers in edit mode using the TAB key to move into each space.

To execute the calculations, leave edit mode and type the location coordinates *1/1*↩ to move the screen "window" to the beginning of the file. Then type the command *COMPUTE*↩

You must move the screen "window" to the top of the file in order to compute from the top. The COMPUTE command starts computing from the top line of the screen "window," which lets you use this function to compute only a section of a report. COMPUTE starts from the top of the "window" and computes to the bottom of the file.

Figure 5 shows the worksheet after we typed numbers in some of the blanks and typed the COMPUTE command.

Bar Charts

Bar charts can be drawn quickly and easily. Perhaps the easiest way to chart a row is to use *frame mode* to draw a horizontal or L-shaped frame.

With frame mode activated, you can leave edit mode and type the BAR command. The "framed" row is easily charted with the following command:

```
SOURCE CODE TABLE
=================

**********************************************************************
The codes used on different coupons are UGp, UGc, GRI, FOG, OT1 and OT2.
Fill in the date and the number of responses, if any, under each code
in the      space (don't fill in      spaces, they are for totals).
                                  =======
**********************************************************************

Date:
          __________
ex        99999     99999     99999     99999     99999     99999     999,999
acl       +         +         +         +         +         +         =

PAID SUBSCRIBERS:
cn        UGpp (pre) UGcp (cur) GRIp      FOGp      OT1p      OT2p      TOTAL.PAID
++        Typist enters the daily subtotals on this row.
          ------     ------     ------    ------    ------    ------    =======

BILLED SUBSCRIBERS:
cn        UGpb (pre) UGcb (cur) GRIb      FOGb      OT1b      OT2b      TOTAL.BILLED
++
          ------     ------     ------    ------    ------    ------    =======

SUBSCRIBER INQUIRY:
cn        UGpi (pre) UGci (cur) GRIi      FOGi      OT1i      OT2i      TOTAL.INQUIRY
+
          ------     ------     ------    ------    ------    ------    =======
ex        999,999    999,999    999,999   999,999   999,999   999,999   999,999

**********************************************************************
The following rows and columns are results, not to be filled in.
**********************************************************************

TOTAL RESPONSES:
cn        UGpr       UGcr       GRIr      FOGr      OT1r      OT2r      TOTAL.RESPONSE
=         Results are computed by T/Maker III.
          =======    =======    =======   =======   =======   =======   =======

TOTAL SUBSCRIBERS:
cn        UGps       UGcs       GRIs      FOGs      OT1s      OT2s      TOTAL.SUBS
=
          =======    =======    =======   =======   =======   =======   =======
```

Figure 4. *A blank worksheet for typists to use to tally daily incoming responses. Results can be computed quickly, and daily worksheets combined with other worksheets to summarize and chart bar graphs for weekly reports.*

© 1984 TUG, Inc., *User's Guide* vol 2.1 no. 7

```
SOURCE CODE TABLE
=================



*********************************************************************
The codes used on different coupons are UGp, UGc, GRI, FOG, OT1 and OT2.
Fill in the date and the number of responses, if any, under each code
in the     space (don't fill in       spaces, they are for totals).
       -----                      =======
*********************************************************************

Date:       12/30/83
            ------------

ex      99999       99999       99999       99999       99999       99999       999,999
acl     +           +           +           +           +           +           =

PAID SUBSCRIBERS:

cn      UGpp (pre)  UGcp (cur)  GRIp        FOGp        OT1p        OT2p        TOTAL.PAID
++         25          35          20          15          24          12          131
        -----       -----       ------      -----       -----       -----       =======

BILLED SUBSCRIBERS:

cn      UGpb (pre)  UGcb (cur)  GRIb        FOGb        OT1b        OT2b        TOTAL.BILLED
++         20          18          4           6          10           2           60
        -----       -----       -----       -----       -----       -----       =======

SUBSCRIBER INQUIRY:

cn      UGpi (pre)  UGci (cur)  GRIi        FOGi        OT1i        OT2i        TOTAL.INQUIRY
+          18          22          28          14          24          28          134
        -------     ------      ------      ------      ------      ------      =======
ex      999,999     999,999     999,999     999,999     999,999     999,999     999,999

*********************************************************************
The following rows and columns are results, not to be filled in.
*********************************************************************

TOTAL RESPONSES:

cn      UGpr        UGcr        GRIr        FOGr        OT1r        OT2r        TOTAL.RESPONSE
=          63          75          52          35          58          42          325
        =======     =======     =======     =======     =======     =======     =======

TOTAL SUBSCRIBERS:

cn      UGps        UGcs        GRIs        FOGs        OT1s        OT2s        TOTAL.SUBS
=          45          53          24          21          34          14          191
        =======     =======     =======     =======     =======     =======     =======
```

Figure 5. *The worksheet in figure 4 with numbers entered and results computed.*

```
                <0 it /                                                  131>
UGpp        25  ///////////
UGcp        35  ///////////////
GRIp        20  ////////
FOGp        15  ///////
OT1p        24  //////////
OT2p        12  /////
TOTAL.P    131  ////////////////////////////////////////////////////////////
```

Figure 6. *Charting a row from the worksheet in figure 5. The total line is included, and the maximum limit is set to it.*

```
                <0 it /                                                   40>
UGpp        25  ////////////////////////////////////
UGcp        35  ////////////////////////////////////////////////////
GRIp        20  ////////////////////////////
FOGp        15  ////////////////////
OT1p        24  ////////////////////////////////////
OT2p        12  ////////////////
TOTAL.P    131  ////////////////////////////////////////////////////////////>
```

Figure 7. *The result of resetting the maximum limit to 40. The total line can be ignored for now and deleted once the chart is inserted into the workspace for editing with the report.*

WHAT NEXT? *bar it*↩

The pronoun *it* stands for the "framed" row or column. To activate frame mode, press ESCape and *F* (or whatever you changed the command to).

To draw a horizontal frame, move your cursor to the first column of the row to be charted, then activate frame mode (ESC-*F*). The first row under the frame is the "framed" row.

To draw an L-shaped frame, the cursor can be anywhere on the row to be charted except in the first column. The "framed" row is the first one under the horizontal part of the L-shaped line.

To produce the bar chart in figure 6, first move the cursor to the row of numbers (under paid subscriptions), then activate frame mode to draw a horizontal frame, leave edit mode (Control *Q* or whatever you changed it to), and type the following command:

WHAT NEXT? *bar it names 11*↩

Figure 6 shows the result of typing the above BAR command. The phrase *names 11* defines 11 spaces to the left of the bar chart to be used for column names. BAR picks up the names from the *cn* line of the worksheet.

The strange line above the bar chart (with right and left angle brackets) shows the limits of the chart (0 to 131). The TOTAL line is also charted, which pushed the limit so high. To minimize the effect of the TOTAL line, you can set a new limit, preferably one that is less than 131.

After drawing the chart, the BAR command displays an OPTIONS? prompt. You can type more options such as a new maximum limit, and even counteract options (such as changing *names* to be more or less spaces).

Type the following option to change the maximum limit:

OPTIONS? *max 40*↩

© 1984 TUG, Inc., *User's Guide* vol 2.1 no. 7

```
SOURCE CODE TABLE
=================

*********************************************************************
The codes used on different coupons are UGp, UGc, GRI, FOG, OT1 and OT2.
Fill in the date and the number of responses, if any, under each code
in the     space (don't fill in       spaces, they are for totals).
        -----                      =======
*********************************************************************

Date:       12/31/83
            ----------

ex      99999       99999       99999       99999       99999       99999       999,999
acl     +           +           +           +           +           +           =

PAID SUBSCRIBERS:

cn      UGpp (pre)  UGcp (cur)  GRIp        FOGp        OT1p        OT2p        TOTAL.PAID
++          10          15          20          25          14          10          94
        ------      ------      ------      ------      ------      ------      =======

BILLED SUBSCRIBERS:

cn      UGpb (pre)  UGcb (cur)  GRIb        FOGb        OT1b        OT2b        TOTAL.BILLED
++           6           8           4           4          10           2          34
        ------      ------      ------      ------      ------      ------      =======

SUBSCRIBER INQUIRY:

cn      UGpi (pre)  UGci (cur)  GRIi        FOGi        OT1i        OT2i        TOTAL.INQUIRY
+           4           6          20           4          35          30          99
        ------      ------      ------      ------      ------      ------      =======
ex      999,999     999,999     999,999     999,999     999,999     999,999     999,999

*********************************************************************
The following rows and columns are results, not to be filled in.
*********************************************************************

TOTAL RESPONSES:

cn      UGpr        UGcr        GRIr        FOGr        OT1r        OT2r        TOTAL.RESPONSE
=          20          29          44          33          59          42         227
        =======     =======     =======     =======     =======     =======     =======

TOTAL SUBSCRIBERS:

cn      UGps        UGcs        GRIs        FOGs        OT1s        OT2s        TOTAL.SUBS
 =          16          23          24          29          24          12         128
        =======     =======     =======     =======     =======     =======     =======
```

Figure 8. *A recently computed worksheet currently in the workspace, about to be combined with a worksheet on disk (the one from figure 5).*

```
SOURCE CODE TABLE
=================

*********************************************************************
The codes used on different coupons are UGp, UGc, GRI, FOG, OT1 and OT2.
Fill in the date and the number of responses, if any, under each code
in the     space (don't fill in       spaces, they are for totals).
        ------                    =======
*********************************************************************

Date:       12/31/83
            ----------
ex      99999       99999       99999       99999       99999       99999       999,999
ac1     +           +           +           +           +           +           =

PAID SUBSCRIBERS:

cn      UGpp (pre)  UGcp (cur)  GRIp        FOGp        OT1p        OT2p        TOTAL.PAID
++          35          50          40          40          38          22          225
        ------      ------      ------      ------      ------      ------      =======

BILLED SUBSCRIBERS:

cn      UGpb (pre)  UGcb (cur)  GRIb        FOGb        OT1b        OT2b        TOTAL.BILLED
++          26          26           8          10          20           4           94
        ------      ------      ------      ------      ------      ------      =======

SUBSCRIBER INQUIRY:

cn      UGpi (pre)  UGci (cur)  GRIi        FOGi        OT1i        OT2i        TOTAL.INQUIRY
+           22          28          48          18          59          58          233
        ------      ------      ------      ------      ------      ------      =======
ex      999,999     999,999     999,999     999,999     999,999     999,999     999,999

*********************************************************************
The following rows and columns are results, not to be filled in.
*********************************************************************

TOTAL RESPONSES:

cn      UGpr        UGcr        GRIr        FOGr        OT1r        OT2r        TOTAL.RESPONSE
=           83         104          96          68         117          84         552
        =======     =======     =======     =======     =======     =======     =======

TOTAL SUBSCRIBERS:

cn      UGps        UGcs        GRIs        FOGs        OT1s        OT2s        TOTAL.SUBS
 =          61          76          48          50          58          26         319
        =======     =======     =======     =======     =======     =======     =======
```

Figure 9. *The result of combining the worksheet on disk (figure 5) with the one in the workspace (figure 8), summing the values and placing the results in the appropriate table positions in the workspace.*

© 1984 TUG, Inc., *User's Guide* vol 2.1 no. 7

```
SOURCE CODE TABLE
=================

**********************************************************************
The codes used on different coupons are UGp, UGc, GRI, FOG, OT1 and OT2.
Fill in the date and the number of responses, if any, under each code
in the     space (don't fill in       spaces, they are for totals).
      _____                       =======
**********************************************************************

Date:      {date.s     }
            ___________

ex      99999       99999       99999       99999       99999       99999       999,999
acl     +           +           +           +           +           +           =

PAID SUBSCRIBERS:

cn      UGpp (pre) UGcp (cur) GRIp        FOGp        OT1p        OT2p        TOTAL.PAID
++     {ugpp }     {ugcp }    {grip }     {fogp }     {ot1p }     {ot2p }     {total.p}
        ------      ------     ------      ------      ------      ------      =======

BILLED SUBSCRIBERS:

cn      UGpb (pre) UGcb (cur) GRIb        FOGb        OT1b        OT2b        TOTAL.BILLED
++     {ugpb }     {ugcb }    {grib }     {fogb }     {ot1b }     {ot2b }     {total.b}
        ------      ------     ------      ------      ------      ------      =======

SUBSCRIBER INQUIRY:

cn      UGpi (pre) UGci (cur) GRIi        FOGi        OT1i        OT2i        TOTAL.INQUIRY
+      {ugpi }     {ugci }    {grii }     {fogi }     {ot1i }     {ot2i }     {total.i}
        ------      ------     ------      ------      ------      ------      =======
ex      999,999     999,999    999,999     999,999     999,999     999,999     999,999

**********************************************************************
The following rows and columns are results, not to be filled in.
**********************************************************************

TOTAL RESPONSES:

cn      UGpr        UGcr        GRIr        FOGr        OT1r        OT2r        TOTAL.RESPONSE
=      {ugpr    }  {ugcr    }  {grir    }  {fogr    }  {ot1r    }  {ot2r    }  {total.r}
        =======     =======     =======     =======     =======     =======     =======

TOTAL SUBSCRIBERS:

cn      UGps        UGcs        GRIs        FOGs        OT1s        OT2s        TOTAL.SUBS
 =     {ugps    }  {ugcs    }  {gris    }  {fogs    }  {ot1s    }  {ot2s    }  {total.s}
        =======     =======     =======     =======     =======     =======     =======
```

Figure 10. *The mask worksheet for the worksheet in figure 9. This mask can load into a data file the numbers from any worksheet that matches it.*

Figure 7 shows the bar chart after typing the *max 40*↩ option. You have the option to insert the chart at the beginning of your workspace, or replace the entire workspace with this chart in order to save the chart by itself in a file.

To save the chart in its own file, type the following:

OPTIONS? *replace*↩

(This option clears the workspace and puts the chart in it.)

OPTIONS? *end*↩

(This ends the BAR command session.)

After typing *end* and pressing Return, the WHAT NEXT? prompt appears. You can save the chart in the workspace file by typing *SAVE*↩ — but first, you might want to use the RENAME command so that an existing workspace file is not overwritten with the chart. RENAME lets you change the workspace file to a new name, thereby creating a new file once you use SAVE to save the workspace.

Combining Worksheets

Keeping each day's response in a separate worksheet solves half our problem. The other half is to combine daily tables into one weekly table, which can be stored until it is needed for marketing reports. The weekly summaries can also be combined into one or more monthly summaries, or as needed.

The COMBINE command combines the worksheet in your workspace with a file on disk. You specify mathematical or terminator symbols to describe how the fields of the first worksheet are to be combined with the fields of the second.

For example, to combine the worksheet shown in figure 5 with a similar worksheet on disk named FRIDAY, and have the data fields *added together* with the result placed in the worksheet on the screen, type this command:

WHAT NEXT? *combine fri + +=*↩

The first plus symbol defines the operation for the disk file: simple positive numbers. Figure 5 is the worksheet on disk (FRI).

The second plus and equal symbols define the addition operation, with the result placed in the second worksheet (the one in the current workspace).

Figure 8 shows the current workspace before executing COMBINE. Figure 9 shows the results of the above command, combining the workspace (figure 8) with FRI, the worksheet on disk (figure 5).

To sum the numbers in the workspace with ones in a file on disk, use the + += expression as shown above. To average the numbers in the workspace with ones in the file FRI on disk, type this command instead:

```
date.s = '12/31/83'
ugpp = '35'
ugcp = '50'
grip = '40'
fogp = '40'
ot1p = '38'
ot2p = '22'
total.p = '225'
ugpb = '26'
ugcb = '26'
grib = '8'
fogb = '10'
ot1b = '20'
ot2b = '4'
total.b = '94'
ugpi = '22'
ugci = '28'
grii = '48'
fogi = '18'
ot1i = '59'
ot2i = '58'
total.i = '233'
ugpr = '83'
ugcr = '104'
grir = '96'
fogr = '68'
ot1r = '117'
ot2r = '84'
total.r = '552'
ugps = '61'
ugcs = '76'
gris = '48'
fogs = '50'
ot1s = '58'
ot2s = '26'
total.s = '319'
```

Figure 11. *The data file produced by unloading the worksheet in figure 9 using the mask in figure 10.*

WHAT NEXT? *combine fri + +avr*↩

To take the numbers in the workspace as a percent of the numbers in the disk file FRI, type this command instead.

WHAT NEXT? *combine fri / +%*↩

Remember that in each case, the operation changes the numbers in the workspace. If you intend to save these numbers, be sure to save them in a new file by using the RENAME command to rename the workspace file to a new name.

You could use COMBINE several times to combine each daily file into one weekly file, then chart the weekly file and store it in your archives. You can also transfer the data from the weekly file into a data file for more compact storage, to be used with another worksheet.

© 1984 TUG, Inc., *User's Guide* vol 2.1 no. 7

```
WEEKLY RESPONSE SUMMARY


Date:        {date.s  }
             ----------
ex      999,999     999,999     999,999     999,999     999,999     999,999     999,999
ucl     +           +           +           +           +           +           +pct

        PAID SUBSCRIBERS:

cn      UGpp (pre)  UGcp (cur)  GRIp        FOGp        OT1p        OT2p        TOTAL.PAID
+       {>ugpp}%    {>ugcp}%    {>grip}%    {>fogp}%    {>ot1p}%    {>ot2p}%    {>tota#1.p}%
        --------    --------    --------    --------    --------    --------    --------

        BILLED SUBSCRIBERS:

cn      UGpb (pre)  UGcb (cur)  GRIb        FOGb        OT1b        OT2b        TOTAL.BILLED
+       {>ugpb}%    {>ugcb}%    {>grib}%    {>fogb}%    {>ot1b}%    {>ot2b}%    {>tota#1.b}%
        --------    --------    --------    --------    --------    --------    --------


        SUBSCRIBER INQUIRY:

cn      UGpi (pre)  UGci (cur)  GRIi        FOGi        OT1i        OT2i        TOTAL.INQUIRY
+       {>ugpi}%    {>ugci}%    {>grii}%    {>fogi}%    {>ot1i}%    {>ot2i}%    {>tota#1.i}%
        --------    --------    --------    --------    --------    --------    --------


        TOTAL RESPONSES:

cn      UGpr        UGcr        GRIr        FOGr        OT1r        OT2r        TOTAL.RESPONSE
+       {>ugpr}%    {>ugcr}%    {>grir}%    {>fogr}%    {>ot1r}%    {>ot2r}%    {>tota#1.r}%
        --------    --------    --------    --------    --------    --------    --------


        TOTAL SUBSCRIBERS:

cn      UGps        UGcs        GRIs        FOGs        OT1s        OT2s        TOTAL.SUBS
+       {>ugps}%    {>ugcs}%    {>gris}%    {>fogs}%    {>ot1s}%    {>ot2s}%    {>tota#1.s}%
        --------    --------    --------    --------    --------    --------    --------
```

Figure 12. *This summary form uses data loaded from the data file in figure 11. INSERT this form into your workspace.*

Data Transfer Between Worksheets

The feature we liked the most about T/Maker III is its ability to handle data transfer between worksheets. You can use the data from worksheets in many different ways, such as in other T/Maker worksheets or as data for other programs. Using the LOAD and UNLOAD commands, you can transfer data from one worksheet to another that is stored in an entirely different format.

Since numbers are stored on disk as ASCII characters, text and numbers can be mixed and stored in data files without any problems.

To set up data transfer, first assign a generic label to each data item on the worksheet. In edit mode replace data areas with generic labels within braces to define the area of the worksheet where data appears. Figure 10 shows such a worksheet, called a *mask*, that can transfer the numbers from the worksheet in figure 9 into a data file.

The mask and worksheet must match. With the mask in your workspace, save it under a new name (use an extension such as ".MSK") by renaming the workspace filename and then using the SAVE command.

To use the mask to create a data file, CREATE a new file with an extension such as ".DAT" and INSERT into the empty workspace the worksheet with numbers (figure 9). Type the following command:

```
        WEEKLY RESPONSE SUMMARY

        Date:       12/31/83
                    ----------
ex      999,999     999,999     999,999     999,999     999,999     999,999     999,999
uc1     +           +           +           +           +           +           +pct

        PAID SUBSCRIBERS:
cn      UGpp (pre)  UGcp (cur)  GRIp        FOGp        OT1p        OT2p        TOTAL.PAID
+            35%         50%         40%         40%         38%         22%        225%
        ---------   ---------   ---------   ---------   ---------   ---------   ---------

        BILLED SUBSCRIBERS:
cn      UGpb (pre)  UGcb (cur)  GRIb        FOGb        OT1b        OT2b        TOTAL.BILLED
+            26%         26%          8%         10%         20%          4%         94%
        ---------   ---------   ---------   ---------   ---------   ---------   ---------

        SUBSCRIBER INQUIRY:
cn      UGpi (pre)  UGci (cur)  GRIi        FOGi        OT1i        OT2i        TOTAL.INQUIRY
+            22%         28%         48%         18%         59%         58%        233%
        ---------   ---------   ---------   ---------   ---------   ---------   ---------

        TOTAL RESPONSES:
cn      UGpr        UGcr        GRIr        FOGr        OT1r        OT2r        TOTAL.RESPONSE
+            83%        104%         96%         68%        117%         84%        552%
        ---------   ---------   ---------   ---------   ---------   ---------   ---------

        TOTAL SUBSCRIBERS:
cn      UGps        UGcs        GRIs        FOGs        OT1s        OT2s        TOTAL.SUBS
+            61%         76%         48%         50%         58%         26%        319%
        --------    --------    --------    --------    --------    --------    --------
```

Figure 13. *With figure 12 in your workspace, use the LOAD command to load the data from figure 11, then use COMPUTE to compute the percentages.*

WHAT NEXT? *unload*↩
WHAT FILE NAME? sample.msk↩ (Name of mask file.)

If the mask and the worksheet match, you should see no error message while the workspace is filled with the data file. If you do see an error message such as 1 LINE NOT COUNTED or similar message, use EDIT to check the workspace and count the data items to find out which items were not included.

Figure 11 shows the data file for the worksheet in figure 9. The data file holds the data in a compact form for use in many different worksheets. Notice how each mask variable is followed by an equal sign and its value, just like the results of a TALLY command. The TALLY command can produce a data file if your row labels can double as mask variable names.

To show how you can transfer data from one worksheet to another, we created a summary worksheet form (figure 12) that receives data from each weekly worksheet. It calculates the percentage of total response for each promotion. Create a new file, and use INSERT to insert this form file (figure 12) into your workspace, then use the LOAD command to load the data file into the mask areas of the worksheet (figure 13 shows the results of the LOAD). Finally, use COMPUTE to compute the results before using SAVE to save it in a new weekly summary file (figure 14 shows the results of the COMPUTE).

The uc1 calculation line uses the +pct function to mark

© 1984 TUG, Inc., *User's Guide* vol 2.1 no. 7

```
WEEKLY RESPONSE SUMMARY

Date:        12/31/83
             ----------
ex     999,999    999,999    999,999    999,999    999,999    999,999    999,999
uc1    +          +          +          +          +          +          +pct

PAID SUBSCRIBERS:

cn     UGpp (pre) UGcp (cur) GRIp       FOGp       OT1p       OT2p       TOTAL.PAID
+          16%        22%        18%        18%        17%        10%        100%
       -------    -------    -------    -------    -------    -------    -------

BILLED SUBSCRIBERS:

cn     UGpb (pre) UGcb (cur) GRIb       FOGb       OT1b       OT2b       TOTAL.BILLED
+          28%        28%         9%        11%        21%         4%        100%
       -------    -------    -------    -------    -------    -------    -------

SUBSCRIBER INQUIRY:

cn     UGpi (pre) UGci (cur) GRIi       FOGi       OT1i       OT2i       TOTAL.INQUIRY
+           9%        12%        21%         8%        25%        25%        100%
       -------    -------    -------    -------    -------    -------    -------

TOTAL RESPONSES:

cn     UGpr       UGcr       GRIr       FOGr       OT1r       OT2r       TOTAL.RESPONSE
+          15%        19%        17%        12%        21%        15%        100%
       -------    -------    -------    -------    -------    -------    -------

TOTAL SUBSCRIBERS:

cn     UGps       UGcs       GRIs       FOGs       OT1s       OT2s       TOTAL.SUBS
+          19%        24%        15%        16%        18%         8%        100%
       -------    -------    -------    -------    -------    -------    -------
```

Figure 14. *The result of using COMPUTE on the summary worksheet, which computes a percentage using the totals as the base for each row.*

the column to use as a base for the percentage calculation. This worksheet loads totals in the +pcnt column and amounts in each of the promotion returns columns, then executes the uc1 line to calculate percentages, which replace the actual amounts after you type the COMPUTE command.

End of Lesson

This tutorial explored the various operations T/Maker III can perform. We did not get into automating operations with T/Maker, which is a bit more complicated. Setting up automatic T/Maker commands is very rewarding in the end, when the multiple operations are performed quickly and easily.

For overall performance we judge T/Maker III to be an excellent package. T/Maker III does find and substitute operations faster than most word processing programs, and its macro facility is one of the easiest and most flexible. The documentation is sufficient (if not overwhelming), and its organization is useful. You need not know everything to use T/Maker, and it is a nice word processing and table making environment you can grow in experience with.

We use T/Maker III in conjunction with a Smartkey definition file to perform multiple operations, which we will explain in an application note we are preparing for a future issue.

Changing T/Maker's Editing Commands

Note that T/Maker III is already customized for the IBM PC function keys. If you are using T/Maker on an IBM PC, skip this section and see below.

Many computers have function keys set up for WordStar® editing commands. The dBASE II® and SuperCalc® programs also use these commands. We decided to change T/Maker's editing commands to resemble WordStar's, at least in name.

This took some time to do because we had to be careful to rename commands that already used WordStar mnemonics but did not resemble the appropriate WordStar command. For example, Control-*S* in the T/Maker language performs the "copy column" operation, so we had to rename "copy column" to Control-*KC* in order to free Control-*S* for use as the "move cursor to the left" operation.

We are accustomed to using Control-*S* and Control-*D* to move the cursor during editing. T/Maker uses other commands, but we renamed them to Control-*S* and Control-*D* so that T/Maker would resemble WordStar. (It turns out that Osborne 01 users who use SETUP to set up their cursor keys as "WordStar" keys can benefit by making this change to T/Maker, because the cursor keys work as they do in WordStar, dBASE II and SuperCalc.)

The TMODIFY program should work with any terminal. It presents a menu of choices for changing T/Maker III to conform to your terminal's characteristics and keystrokes. We use option *9* to change the editing keystrokes.

Note

You should already have a version of T/Maker III configured to your terminal; if not, see if the terminal is listed in option *1* of the menu. If your terminal is not listed, consult your dealer or follow the instructions in the manual.

You can modify almost every T/Maker III input and output characteristic. This makes T/Maker III very easy to move from one system to another, or use on different kinds of terminals connected to one multi-user system.

```
SELECT OPTION TO BE MODIFIED

1. STANDARD TERMINAL CONFIGURATIONS (IE. 5
THRU 8 BELOW)
2. SPECIAL CHARACTERS USED BY T/MAKER
3. DEFAULT PROCESSING OPTIONS
4. PRINTER OUTPUT CONTROL
5. CONSOLE ROWS AND COLUMNS
6. CONSOLE CONTROL - EXCEPT 7 AND 8
7. CURSOR ADDRESSING
8. REVERSE VIDEO CONTROL
9. EDITING KEYSTROKES
10. PRINTER OUTPUT TECHNIQUE
11. CONSOLE INPUT TECHNIQUE
12. CONSOLE OUTPUT TECHNIQUE
13. SYSTEM PATCHES
99. SAVE MODIFICATIONS AND STOP
999. STOP WITHOUT SAVING THE MODIFICATIONS
ENTER OPTION NUMBER? 9↵
```

Options four and nine are the usual controls changed by users who have already installed T/Maker for a particular terminal. Option four lets you specify non-standard printer codes (T/Maker III needed no modification to run with our Epson MX-100).

For WordStar, dBASE II and SuperCalc users, table 1 shows the suggested editing keystroke changes to make in the order that TMODIFY (option *9*) presents them.

Type new keystrokes directly, using a space to end the set of keystrokes for each function. Type a space to skip a function and use the default keystroke.

You should use only one to three characters, shifted or unshifted, with or without the Control key (shown as ↑) held down. The ESCape key and other keys are separate characters, unlike Shift and Control.

IBM PC Function Keys

The IBM PC version of T/Maker III is already customized for the PC's function keys. You don't have to change anything unless you don't like this configuration:

Revise Text

Ins Insert character.
F1 Insert line.
DEL Delete character.
F2 Delete line.
Esc Ins
Delete spaces.
Esc Del
Erase to end of line.
Esc F2
Join lines.
Esc F1
Break lines.

Search and Replace

Esc PgDn
Search for string.
PgDnContinue search.
F9 Replace strings.

Keystroke Macros

F7 Begin macro.
Esc F7
Home macro.
F8 End macro or execute once.
Esc F8
End macro or execute many times.

To change these function keys, use TMODIFY and step through the editing keystrokes shown in table 1. Use whatever new keystrokes you want by typing the key combination after the NEW STROKES prompt. Be sure to use a different function key for each function.

Move Lines

Esc F4
Clear the buffer.
F3 Copy to the buffer.
F4 Move to the buffer.
Esc F3
Insert the buffer.

Move Columns

Esc F5
Set the left limit.
Esc F6
Set the right limit.
F5 Copy columns.
F6 Move columns.

Others

Esc Q Quit the editor.
Ctrl-Z Repeat last keystrokes.
F10 Information.
Esc F10 Redraw the screen.

© 1984 TUG, Inc., *User's Guide* vol 2.1 no. 7

EDITING KEYSTROKES: TMODIFY option 9

(Blank space after "NEW STROKES?" means the old keystroke is still in use.)

QUIT THE EDITOR	IS	^Q			NEW STROKES?	^U			
REPEAT LAST KEYSTROKES	IS	^A			NEW STROKES?	^Q	^Q		
SCREEN DOWN	IS	ESC	^J		NEW STROKES?	^C			
SCREEN UP	IS	ESC	^K		NEW STROKES?	^R			
SCREEN LEFT	IS	ESC	^H		NEW STROKES?				
SCREEN RIGHT	IS	ESC	^L		NEW STROKES?				
MOVE TO THE FIRST LINE	IS	ESC	A		NEW STROKES?				
MOVE TO THE BOTTOM LINE	IS	ESC	Z		NEW STROKES?				
RETURN THE SCREEN	IS	ESC	^M		NEW STROKES?	^J			
HOME THE SCREEN	IS	ESC	^O		NEW STROKES?				
REDRAW THE SCREEN	IS	ESC	#		NEW STROKES?				
CURSOR UP	IS	^K			NEW STROKES?	^E			
CURSOR DOWN	IS	^J			NEW STROKES?	^X			
CURSOR LEFT	IS	^H			NEW STROKES?	^S			
CURSOR RIGHT	IS	^L			NEW STROKES?	^D			
RETURN THE CURSOR	IS	^M			NEW STROKES?				
HOME THE CURSOR	IS	^O			NEW STROKES?	^Q	E		
ADVANCE TO NEXT WORD	IS	^P			NEW STROKES?	^F			
ADVANCE TO END OF LINE	IS	ESC	^P		NEW STROKES?	^Q	D		
INSERT A CHARACTER	IS	^W			NEW STROKES?				
DELETE A CHARACTER	IS	^E			NEW STROKES?	^G			
DELETE MULTIPLE SPACES	IS	^U			NEW STROKES?	^P			
INSERT A LINE	IS	^R			NEW STROKES?	^N			
DELETE A LINE	IS	^T			NEW STROKES?	^Y			
ERASE TO END OF LINE	IS	^Y			NEW STROKES?	^Q	Y		
DESTRUCTIVE BACKSPACE	IS	DEL			NEW STROKES?				
BREAK LINES	IS	ESC	>		NEW STROKES?				
JOIN LINES	IS	ESC	<		NEW STROKES?				
INSERT MODE CHANGE	IS	ESC	I		NEW STROKES?	^V			
<RET> MODE CHANGE	IS	ESC	R		NEW STROKES?				
FRAME MODE CHANGE	IS	ESC	F		NEW STROKES?	^Z			
CLEAR ALL TABS	IS	ESC	C	^I	NEW STROKES?				
SET ALL TABS	IS	ESC	S	^I	NEW STROKES?				
SET A TAB	IS	ESC	^I		NEW STROKES?	^O	I	ESC	
CLEAR A TAB	IS	ESC	ESC	^I	NEW STROKES?	^O	N	ESC	
TAB	IS	^I			NEW STROKES?				
COPY TO THE BUFFER	IS	^F			NEW STROKES?	^K	W		
MOVE TO THE BUFFER	IS	^G			NEW STROKES?	^K	M		
INSERT THE BUFFER	IS	^D			NEW STROKES?	^K	I		
CLEAR THE BUFFER	IS	^C			NEW STROKES?	^K	Y		
COPY COLUMNS	IS	^S			NEW STROKES?	^K	C		
MOVE COLUMNS	IS	^V			NEW STROKES?	^K	V		
SET LEFT COLUMN LIMIT	IS	ESC	(		NEW STROKES?				
SET RIGHT COLUMN LIMIT	IS	ESC	)		NEW STROKES?				
HOME MACRO	IS	^N			NEW STROKES?	^Q	N		
BEGIN MACRO	IS	^B			NEW STROKES?	^Q	B		
END/EXECUTE MACRO ONCE	IS	^X			NEW STROKES?	^Q	X		
END/EXECUTE MANY TIMES	IS	^Z			NEW STROKES?	^Q	M		
INFORMATION	IS	ESC	?		NEW STROKES?				
SEARCH FOR A STRING	IS	ESC	'		NEW STROKES?	^Q	F		
CONTINUE THE SEARCH	IS	ESC	&		NEW STROKES?	^L			
REPLACE STRINGS	IS	ESC	"		NEW STROKES?	^Q	A		

Table 1. *Using TMODIFY, T/Maker III's editing keystrokes are changed to match WordStar's editing commands, which are also used by programs like dBASE II and SuperCalc.*

CP/M-80 •
CP/M-86 •
MS-DOS •

The Rainbow

An eight/sixteen-bit computer from Digital Equipment Corp.

by Tony Bove & Cheryl Rhodes

The Rainbow was perhaps the most ignored personal computer of 1983, with one journalist claiming he knew nobody who actually used one. Digital Equipment Corporation's Rainbow, billed as an "executive's computer," was perhaps overpriced (although not compared to other "executive" computers), and DEC did blunder into the market with an absurd requirement for special DEC floppy disks.

However, with these wrinkles smoothed (any disk can be formatted using public domain formatting programs), with the package deals offered by retailers, and with the abundance of CP/M-80 programs available, the Rainbow is an attractive computer for the executive.

The Rainbow computer comes with a powerful CP/M hybrid, designed by Digital Equipment Corp. (DEC), that can

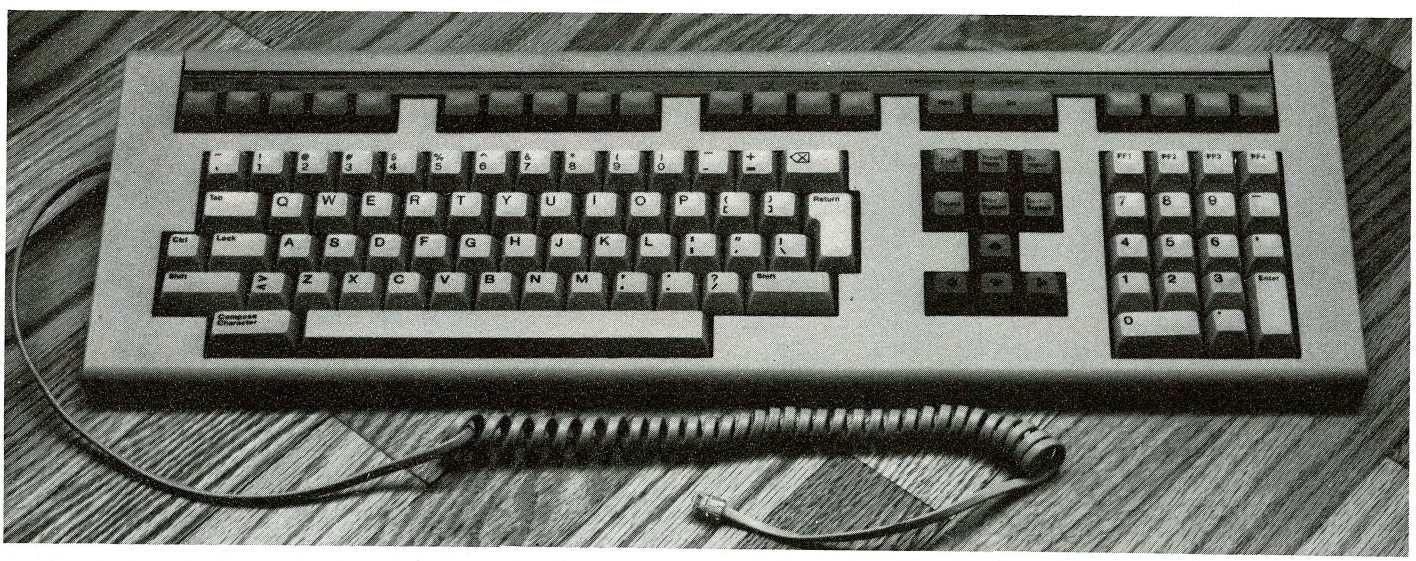


Figure 1. *The DEC Rainbow keyboard, featuring a strip of twenty multipurpose function keys.*

© 1984 TUG, Inc., *User's Guide* vol 2.1 no. 7

run both eight-bit and sixteen-bit CP/M software. The Rainbow can also run MS-DOS, making it one of the unique machines that can run nearly every application program for eight-bit CP/M, sixteen-bit CP/M and MS-DOS.

This article describes how it feels to use the Rainbow's version of CP/M.

The Keyboard and Display

The Rainbow's keyboard has the best feel and touch feedback of any keyboard we've ever used. The keyboard feels like it was meant for plush carpets and Rolls Royces, the environments of executives.

The keyboard is also large, but lightweight and detachable, with a coiled cable attaching it to the display unit. The display is superb, featuring smooth-scrolling technology.

The keyboard has a strip of twenty *function keys* used by different programs as well as several standard computer keyboard keys. The keyboard is shown in figure 1. Function key strips to place inside the label window are available for CP/M and DEC application packages.

CP/M is a registered trademark of Digital Research, Inc. Rainbow is a trademark of Digital Equipment Corp. MS-DOS is a trademark of Microsoft.

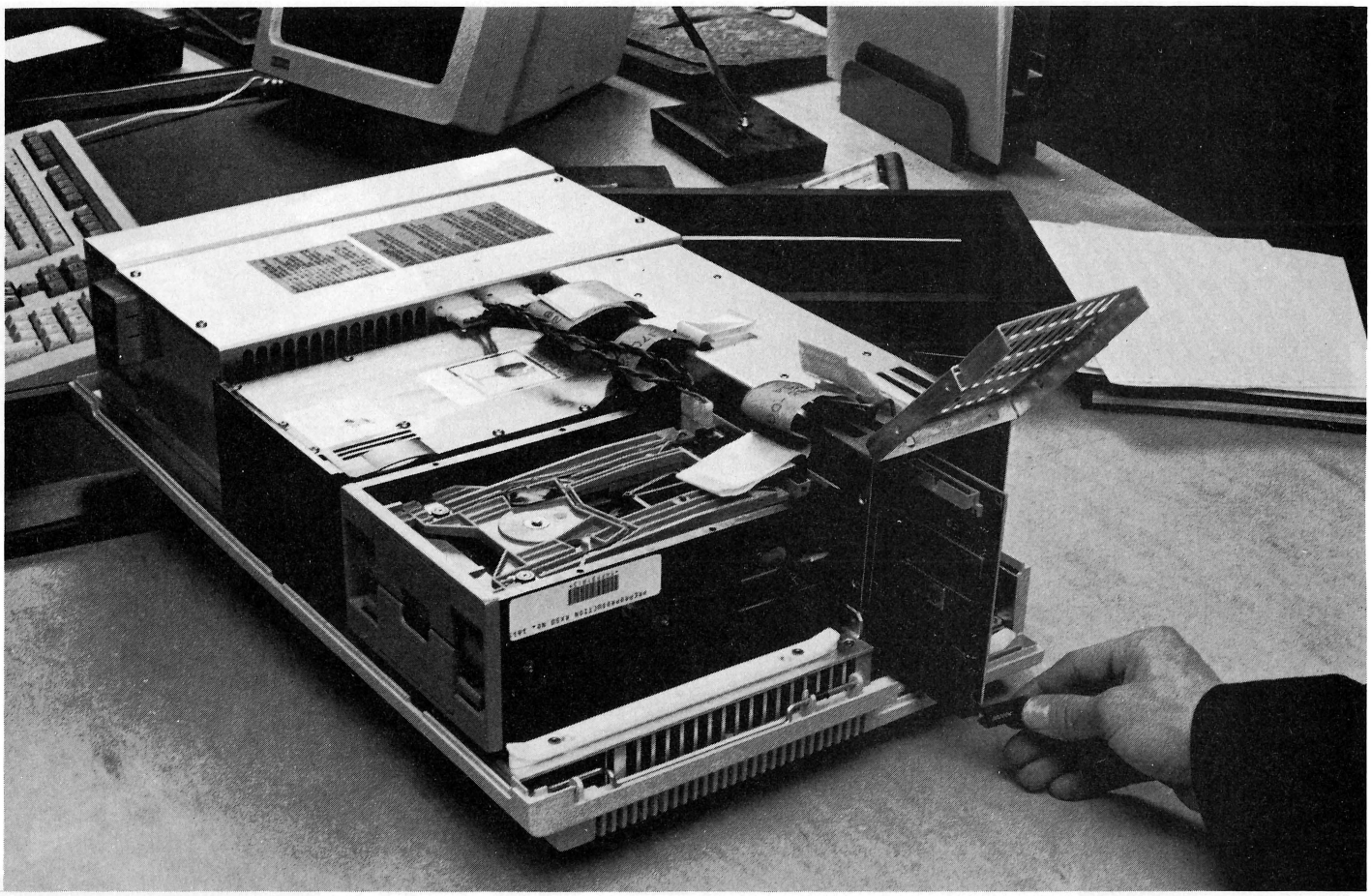
Typesetting Conventions

Throughout this article we use *THIS typeface* to show exactly what you should type at your keyboard, with the special symbols ↑ for the Control key (CTRL, CNTL or ALT on some keyboards), and ↵ for the Return key (RET, CR or Carriage Return on some keyboards). We also use This Typeface to show messages displayed by the system or by programs.

Starting the System

To start the Rainbow system you press the Setup key once, then hold down your Control key and press Setup again. This combination (Setup, then Control-Setup) performs a system reset. You should then see this on the excellent Rainbow screen:

A = start from Drive A
B = start from Drive B
C = start from Drive C
D = start from Drive D
S = execute Self Test
T = enter Terminal Mode



The Rainbow gives you the choice of having drive A, B, C or D act as a system drive, or to execute a comprehensive self test, or to enter "terminal mode" where the computer acts like a DEC VT-100 terminal with the appropriate protocols for communicating with DEC minicomputers.

Insert a system disk into the drive you will select for the system drive (usually A), then select the drive to start the system.

When the Rainbow was first introduced, you had to purchase *pre-formatted* disks from your DEC dealer. Although the disks themselves are standard 5.25-inch single-sided double-density disks, DEC has a proprietary disk format that can hold far more data on a single-sided disk than any other format. However, several formatting programs became available in the public domain (some not supported by DEC), and now a disk formatting program is available for the Rainbow.

Copying the System Disk

The Rainbow provides the COPY program that copies the entire contents of one disk to another disk. Using COPY is the easiest way to make a copy of a system disk or data disk. Although LDCOPY and PIP are also provided to copy the system tracks and individual files, COPY copies everything more quickly. In fact, it is easier to COPY an entire system disk to make a new one, and erase the unwanted files on the new system disk, than to use LDCOPY to copy the system and PIP to copy all the individual files needed.

To copy the system disk in drive A, place a pre-formatted blank disk in drive B and type the following command:

A)*COPY*↵

The COPY program asks for confirmation that the copy occur from drive A to drive B. Type *Y* to confirm:

COPY FROM DISKETTE A TO DISKETTE B? (Y/N) *Y*

INSERT SOURCE DISKETTE INTO DRIVE A
INSERT DESTINATION DISKETTE INTO DRIVE B

START COPYING? (Y/N) Y

If you want to "back out" of the operation without performing it, type *N* to *not confirm* the copy operation. If you type *Y* the copy operation continues, counting and displaying the number of each track as it is read from the system disk in

© 1984 TUG, Inc., *User's Guide* vol 2.1 no. 7

```
Drive: A        File Specification: ????????.???     User: 0

FileName Typ Attrib  KBs  FileName Typ Attrib  KBs  FileName Typ Attrib  KBs
COPY     COM RW Dir    4  PIP      CMD RW Dir    8  SUBMIT   CMD RW Sys    4
CPM      SYS RW Sys   14  PRMTVPVT SYS RW Sys    2  Z80      SYS RW Sys    2
DEMO     DOC RW Dir    2  STAT     CMD RW Dir   10  Z80CCP   SYS RW Sys    4
MAINT    CMD RW Dir   20
```

Figure 2. *The MAINT directory display, where you can edit the directory entries directly.*

```
Drive: A        File Specification: ????????.???     User: 0

                File Space Allocation Summary

                              KBs  FCBs
              This User   :    70    10
              Other Users:     0     0
              Available   :   316   118
              Total       :   386   128

            Disk Access: R/W
```

Figure 3. *The Next Screen of the MAINT display.*

drive A and written to the copy disk in drive B.

At the end of the copy operation, COPY displays:

```
COPY/VERIFY COMPLETE TO DRIVE B
IF YOU WANT ANOTHER COPY, INSERT NEW DISKETTE
INTO DRIVE B
DO YOU WANT ANOTHER COPY? (Y/N)
```

If you want to make a second copy, insert a new disk in drive B and type *Y* again; otherwise, type *N*. The program displays another message:

```
INSERT SYSTEM DISKETTE TO RESTART CP/M-86/80
THEN PRESS Exit
```

Since you copied a system disk, the system disk is already in drive A. To copy a data disk, substitute the data disk for the system disk after starting the COPY program (after typing *COPY* and pressing Return), and continue the operation. At the end, replace the data disk with a system disk before pressing the Exit key.

The Exit key returns you to the CP/M command line. The Exit key is located above the "9" key in the Rainbow's function key row.

The MAINT Program

DEC provides a useful program called MAINT (not found in other CP/M systems) which puts a disk directory on the screen for you to edit the names and attributes of files.

Type *MAINT* and press Return, and the program should display a directory similar to the one in figure 2.

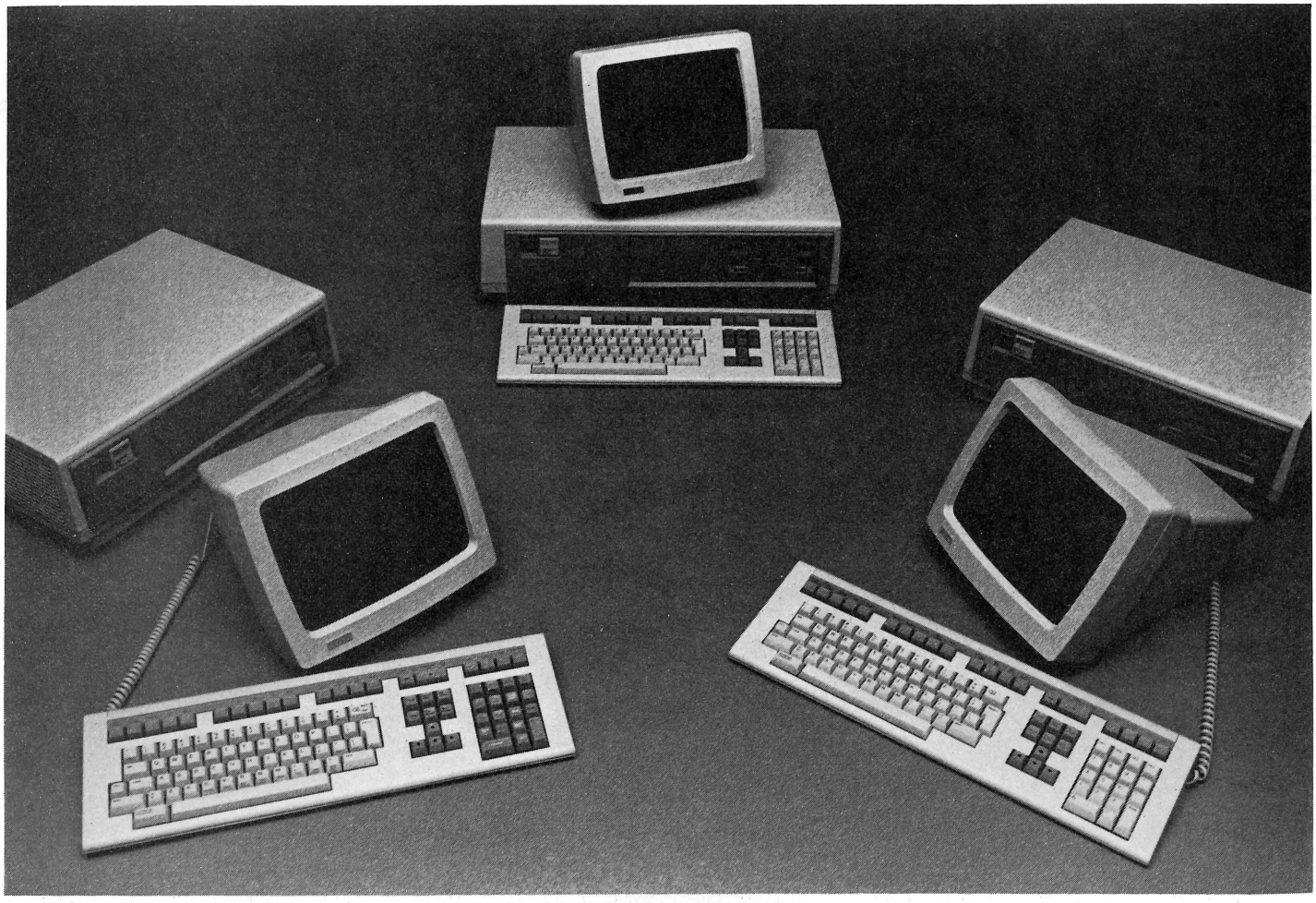
If you press the Next Screen Key, you get the display in figure 3.

The numbers in the KBs column are in *kilobytes*. File space is measured in kilobytes, or 1K bytes, where "1K" stands for 1024 bytes. One byte can hold one character of information — a letter, digit, punctuation symbol, space, dollar sign, etc. The amount of file space is a restriction on the amount of *data*.

The numbers in the FCBs column represent the number of directory entries, or *file control blocks*, that are used and are available for use. This number restricts the number of files you can have with different names on the disk.

To return to the directory display, press the Prev Screen key. The cursor keys move the cursor to any point in the display. To view the contents of a file, move to the name (such as DEMO.DOC) and press the Addtnl Options key. MAINT displays the contents of the file. To return to the MAINT directory display, press the Exit key.

To change the name of a file, move the cursor to the first character of the old name, and type the new name over the



old one (be sure to type spaces over unused positions). After typing the new name, press the Do key to record it. If you don't want to make the name change, press the Cancel key to cancel it.

To erase a file, move the cursor to the first character of the filename and press the Remove key. This marks the file for erasing, but it does not actually erase the file — you can undo the command by pressing the Cancel key. To actually erase the marked file, you have to press the Do key.

MAINT lets you view a file's contents, rename a file, or erase a file. CP/M commands also perform these tasks, and sometimes the CP/M commands can be quicker because they can act on several files at once, or on all files on the disk (except the REN command, which renames only one file).

Note the File Specification: ????????.??? at the top of the MAINT display. The question marks are like "wild cards" standing for each position of a filename. The eight question marks stand for any set of eight characters (including blanks); the three following the period stand for any three characters.

The writers express their gratitude to the Berkeley Computer Center (Solano Ave., Berkeley CA) for their help in preparing this article. The Berkeley Computer Center is an authorized DEC Rainbow dealer.

Conclusion

To a veteran CP/M system user, the DEC Rainbow version of CP/M is preferable over CP/M-86 by itself. We will compare its performance to other hybrid CP/M systems (CompuPro, Zenith and others) in a future issue.

With the announcements that DEC will support both Concurrent CP/M-86 and MSDOS, the Rainbow is truly more versatile than most computers.

What is also unique about the Rainbow is its upgradeability to the DEC Professional Series. We cannot predict what will happen to this upgrade path while AT&T and IBM are both rumored to be coming out with versions of UNIX.

Concurrency brings minicomputer technology and power to the inexpensive personal computer. With DEC supporting Concurrent CP/M, we should soon see minicomputer software (DECsystem-compatible business and professional application software) running on CP/M. We will also see a software and data compatibility never before achieved across such a diverse marketplace — from high-performance equipment down to portable computers costing less than $500. The Rainbow may be pointing to such a pot of gold.

© 1984 TUG, Inc., *User's Guide* vol 2.1 no. 7

No Postage
Necessary
if mailed
in the U.S.

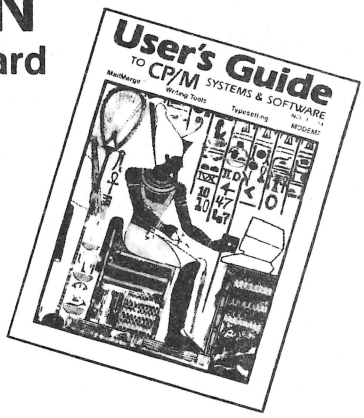
BUSINESS REPLY CARD
FIRST CLASS PERMIT #36 REDWOOD CITY, CA

POSTAGE WILL BE PAID BY ADDRESSEE

User's Guide
P.O. BOX 3050
STANFORD, CA 94305

FREE INFORMATION

User's Guide Reader Service Card



Here is an easy way for you to get manufacturers' information about products advertised or mentioned. Circle the numbers on the card that correspond to key numbers at bottom of advertisements and fill out and mail the postage paid card and the literature will be sent to you free of charge.

No Postage
Necessary
if mailed
in the U.S.

BUSINESS REPLY CARD
FIRST CLASS PERMIT #36 REDWOOD CITY, CA

POSTAGE WILL BE PAID BY ADDRESSEE

User's Guide
P.O. BOX 3050
STANFORD, CA 94305

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

Please complete:

1. Classify your experience with computers: Novice ☐ Intermediate ☐ Advanced ☐
2. Which computer to you use?
   - ☐ Osborne
   - ☐ IBM PC
   - ☐ Apple
   - ☐ Heath/Zenith
   - ☐ TeleVideo
   - ☐ Radio Shack
   - ☐ Kaypro
   - ☐ CompuPro
   - ☐ Morrow
   - ☐ Xerox
   - ☐ S-100
   - ☐ DEC
   - ☐ Sanyo
   - ☐ _____
3. Do you have: ☐ Printer ☐ Modem ☐ Hard disk ☐ _____
4. Which application programs?
   - ☐ Word processing _____
   - ☐ Data base mgmt. _____
   - ☐ Finance/accounting _____
   - ☐ Program development _____
   - ☐ Communications _____
   - ☐ Stat/scientific _____
   - ☐ Games _____
   - ☐ other _____
5. Where do you use your computer? ☐ Small Business ☐ Large Business ☐ Profession ☐ Home ☐ other:

Name _____ Age _____ Sex _____

Occupation _____ Company _____ Title _____

Address _____ City, State, Zip _____

UG 7

Respond Now

Free Information About Software, Personal Computer Systems, and Peripheral Equipment.

Here is an easy way for you to get further information about products advertised or mentioned. Circle the numbers on the card that correspond to key numbers at the bottom of advertisements and product announcements. Fill out and mail the postage paid card and literature will be sent to you free of charge.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

Please complete:

1. Classify your experience with computers: Novice ☐ Intermediate ☐ Advanced ☐
2. Which computer to you use?
   - ☐ Osborne
   - ☐ IBM PC
   - ☐ Apple
   - ☐ Heath/Zenith
   - ☐ TeleVideo
   - ☐ Radio Shack
   - ☐ Kaypro
   - ☐ CompuPro
   - ☐ Morrow
   - ☐ Xerox
   - ☐ S-100
   - ☐ DEC
   - ☐ Sanyo
   - ☐ _____
3. Do you have: ☐ Printer ☐ Modem ☐ Hard disk ☐ _____
4. Which application programs?
   - ☐ Word processing _____
   - ☐ Data base mgmt. _____
   - ☐ Finance/accounting _____
   - ☐ Program development _____
   - ☐ Communications _____
   - ☐ Stat/scientific _____
   - ☐ Games _____
   - ☐ other _____
5. Where do you use your computer? ☐ Small Business ☐ Large Business ☐ Profession ☐ Home ☐ other:

Name _____ Age _____ Sex _____

Occupation _____ Company _____ Title _____

Address _____ City, State, Zip _____

UG 7

FREE INFORMATION
User's Guide Reader Service Card

Each advertisement and product announcement in this issue has a reader service number. To receive mail from the manufacturer, simply circle the same number on this reader service card, and drop the card in the mail. Your name and address is sent on to the appropriate manufacturer, who sends the information.

The service helps you get detailed information about products you may want to purchase. *User's Guide* does not sell or recommend products associated with this service.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100

Please complete:

1. Classify your experience with computers: Novice ☐ Intermediate ☐ Advanced ☐

2. Which computer to you use?
☐ Osborne ☐ CompuPro
☐ IBM PC ☐ Morrow
☐ Apple ☐ Xerox
☐ Heath/Zenith ☐ S-100
☐ TeleVideo ☐ DEC
☐ Radio Shack ☐ Sanyo
☐ Kaypro ☐ _____

3. Do you have: ☐ Printer ☐ Modem
☐ Hard disk ☐ _____

4. Which application programs?
☐ Word processing _____
☐ Data base mgmt. _____
☐ Finance/accounting _____
☐ Program development _____
☐ Communications _____
☐ Stat/scientific _____
☐ Games _____
☐ other _____

5. Where do you use your computer? ☐ Small Business ☐ Large Business
☐ Profession ☐ Home ☐ other:

Name _____ Age _____ Sex _____

Occupation _____ Company _____ Title _____

Address _____ City, State, Zip _____

Mail To: P.O. Box 3050, Stanford, CA 94305 UG7

Advertiser Services

Jay Eisenberg - Advertising Director
JE Publishers' Representative Company
6855 Santa Monica Blvd.
Los Angeles, CA 90038
(213) 467-2266

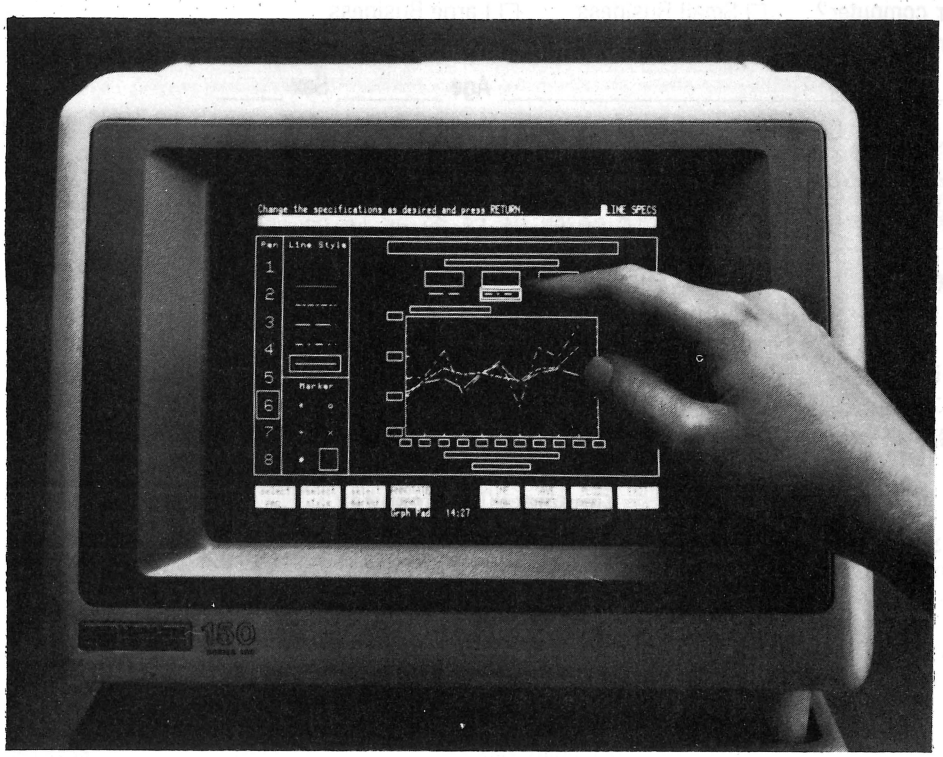
Boston - (617) 437-7628 Chicago - (312) 445-2489
Dallas - (214) 660-2253 Denver - (303) 595-4331
New York - (212) 724-7767 San Francisco - (415) 864-3252

Send all camera-ready materials to:
User's Guide Production
117 Ware Road
Woodside, CA 94062

Advertiser Index

Service		Page
1.	AWARECO	11
2.	CompuPro	C4
3.	Computer Thaumaturgy	9
5.	FOG (First Osborne Group)	1
6.	Hawkeye Grafix	19
7.	International Software Alliance	21
8.	Oasis Systems	C2
9.	Paradigm Consultants	16
10.	SBT	8
12.	Wizard of OsZ	67

Systems, Software, Services, Peripherals, and Accessories



Systems

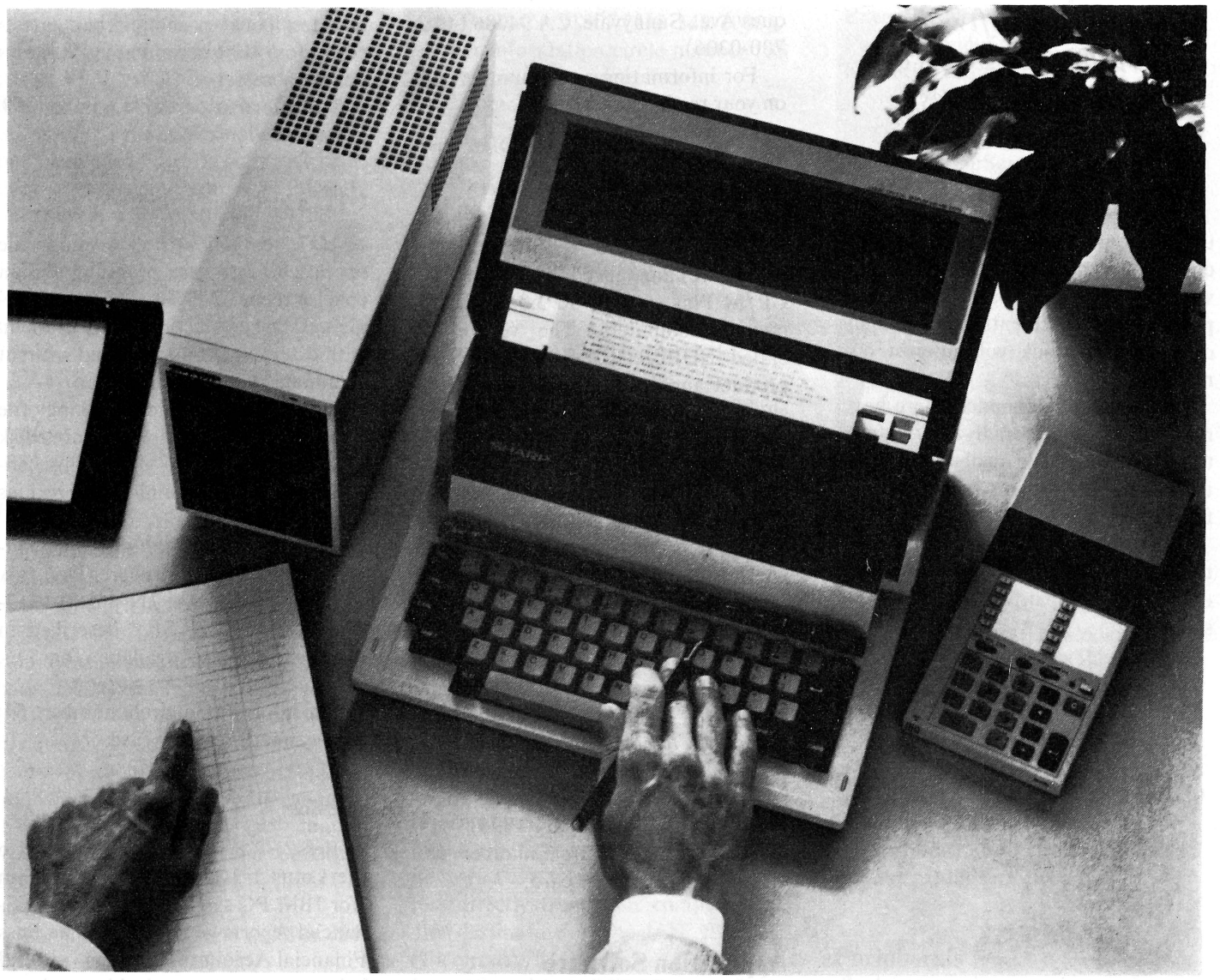
Hewlett-Packard 150 With Touchscreen

The H-P 150 Touchscreen Personal Computer, available now in Computerland stores, now has sixteen touchscreen-enhanced application programs available including WordStar® (MicroPro), VisiCalc (H-P version), dBASE II® (Ashton-Tate, Condor (Condor Computer), BPI Accounting (BPI Systems) and Microplan® (Chang Labs). All of these programs were enhanced to use the touchscreen interface. Users simply touch the screen to move the cursor, make selections from menus and give commands.

Multiplan® and Microsoft Windows® have also been announced for the H-P 150, which runs standard MS-DOS 2.0.

For information circle number **46** on your reader service card.

© 1984 TUG, Inc., *User's Guide* vol 2.1 no. 7



Sharp PC-5000 Portable

Under eleven pounds (not including the optional thermal impact dot matrix printer), the Sharp PC-5000 portable computer has 128K RAM expandable to 256K, 128K bubble memory, MS-DOS in ROM, an eight line by 80 character liquid crystal display, and a typewriter-style keyboard.

The display panel folds flat over the typewriter-style keyboard when not in use. An optional modem with auto-dialing capability is also available, as well as optional disk drives and printer. The unit operates from a rechargeable built-in battery or from an AC adaptor.

The PC-5000 is available from Sharp Electronics, Systems Division, P.O. Box 588, Paramus, NJ 07652.

For information circle number **47** on your reader service card.

Systems, Software, Peripherals, Services, and Accessories

With thousands of computer products announced this year, we cannot cover every new product, nor do we want to subject our readers to lengthy product announcements. We pick only ones that we think will interest our readers.

The products announced here have not been tested or analyzed; in fact, they may not yet be available, even to us for review. Products received by us for review purposes are included here.

If no system is specifically mentioned, assume the product is hardware or software compatible with CP/M-80 systems.

Integrated CP/M Plus System For Apple II

Advanced Logic Systems introduced an integrated software package with a CP/M Plus add-on circuit card for the Apple II family of computers. The Business Card package includes CP/M Plus and T/Maker III (integrated word processing and spreadsheet packaged described in this issue) for $499.

The ALS CP/M card is still the only product that lets you run CP/M Plus on an Apple II. The circuit card provides a six megahertz Z80 processor with an additional 64K high-speed memory. CP/M Plus makes available a variety of CP/M application programs for the Apple II family.

The Business Card is available from Advanced Logic Systems, 1195 E. Arques Ave., Sunnyvale, CA 94086 (408-730-0306).

For information circle number **48** on your reader service card.

CP/M Plus Super BIOS Plus For Cromemco Computers

MICAH (Micro Applications and Hardware) announced their version of CP/M Plus (CP/M-80 3.0) for Cromemco computers. The version is called SUPER BIOS PLUS. This product augments a line of operating systems for Cromemco computers including SUPER BIOS (CP/M 2.2), SUPER XIOS (MP/M II) and EXPAND (CDOS emulator for running Cromemco software under CP/M and MP/M).

SUPER BIOS PLUS is $495 and is a standard implementation of CP/M Plus. For a limited time, buyers of SUPER BIOS PLUS can also purchase the SELECT word processing program (originally designed by Dr. Jerome Freedman, former founder of Select and now founder of MICAH) for only $230. MICAH, P.O. Box 896, Chesterfield, MO 63017 (314-434-1896).

For information circle number **49** on your reader service card.

Application Software & System Utilities

Rescue and Repair, Transmit and Receive

RESCUE & REPAIR® saves text, programs or data entries left in memory after a disk error. RESCUE & REPAIR help you recover and reconstruct files that were lost because a disk full, select or bad sector error occurred, or because you inadvertently forgot to perform a save.

RESCUE & REPAIR is handy for WordStar users who would otherwise lose text when such an error occurs. The package is available for $45 from 21st Century Data, Inc., P.O. Box 1139, Solana Beach, CA, 92075 (619-755-6218).

TRANSMIT & RECEIVE is a $25 package, also from 21st Century Data, that lets you perform error-free file transfers between computers connected by four-wire serial cable. Modems are not necessary.

For information circle number **50** on your reader service card.

UTL, a Universal Utility

UTL® consolidates six common file operations into one program with a concise menu. All commands are single-keystroke selections from a menu with extensive prompting, and without command syntax to remember.

Operations include checking file sizes, displaying a directory and disk space available, and displaying contents of files including the previous screen.

UTL is priced at $29.95 and is available from EWDP Software, P.O. Box 40283, Indianapolis, IN 46240 (317-872-899). FILEBASE,® described in this issue, is also available for $75. Both are for CP/M-80 systems.

For information circle number **51** on your reader service card.

The Boss

Boss/1-2-3 is an add-on module to the Lotus 1-2-3 spreadsheet program (for IBM PC systems) that merges financial reports generated by The Boss Financial Accounting System (general ledger, accounts receivable, and accounts payable) directly into 1-2-3 spreadsheet and graphics.

Users select reports from a menu, and Boss/1-2-3 creates a file which is read directly into a 1-2-3 worksheet. Included with the package are pre-configured worksheets. The package retails for $195 and is available for the IBM PC and XT, the Texas Instruments Professional Computer, the DEC Rainbow 100 and the Wang Professional Computer.

Boss/1-2-3 is from Balcones Computer Corp., 5910 Courtyard, Austin, Texas 78731 (800-531-5483).

For information circle number **52** on your reader service card.

Mailer

Mailer features a "fill in the blanks" screen form for data entry to a

© 1984 TUG, Inc., *User's Guide* vol 2.1 no. 7

file that holds name, address and phone information with a salutation for each person for using with personalized form letters. Mailer handles Canadian addresses, can maintain files by company name, can sort by reference category or state, and can print directly onto envelopes or three-across labels.

List price is $150. Mailer version 1.2 (CP/M-80) is available from Maurizi Associates, 1344 Fitch Way, Sacramento, CA 95825 (916-486-2993).

For information circle number **53** on your reader service card.

EUREKA!

Mendocino Software Company announced a new disk cataloging program called EUREKA!® for CP/M-80 systems. The program lets you keep comments about files in a catalog data base, to keep track of disk file archives. EUREKA! lets you find a particular file quickly by searching for words in a comment about the file, or by searching by partial filename or disk name.

EUREKA! retails for $50 and is available from Mendocino Software Company, P.O. Box 1564, Willits, CA 95490 (707-459-9130).

For information circle number **54** on your reader service card.

Electronic Mail Manager

EMM® provides a private electronic mail network where unattended computers at different locations can send and receive messages and transfer files using error-checking protocols. EMM is written in dBASE II and presents a menu of selections.

At each "branch" users have mailbox numbers controlled by passwords. One master station serves as a controlling station. Up to 1000 mailboxes can be assigned on the network.

EMM is used in conjunction with the COMMX communications package. Price is $99 (CP/M-80) and $150 (CP/M-86, PC-DOS and MS-DOS). Source code is available for an extra licensing fee.

EMM and COMMX are from Hawkeye Grafix, 23914 Mobile, Canoga Park, CA 91307 (213-348-7909).

For information circle number **55** on your reader service card.

New MICRO LINK II

Version 2.0 of the popular MICRO LINK II communications program is now available for CP/M-80, CP/M-86, Concurrent CP/M-86, PC-DOS and MS-DOS.

The new release adds automatic log-on capability, Telex answerbacks, and an expanded user's manual.

MICRO LINK II, priced at $99 retail, is available from Digital Marketing, 2363 Boulevard Circle, Walnut Creek, CA 94595 (800-826-2222).

For information circle number **56** on your reader service card.

Videotex Services

The E-COM Source

Members of The Source, an on-line information and communications service for personal computer users, can now send E-COM electronic mail letters directly from their computers to any destination in the U.S. E-COM (Electronic Computer Originated First-Class Mail) is a service of the U.S. Postal Service. E-COM messages are printed on paper, inserted into a highly-visible blue and white envelope, and delivered as first-class mail by a U.S. Post Office nearest to the addressee.

The Source, operated by Source Telecomputing Corp. (subsidiary of Reader's Digest Association), contracted the service through an E-COM certified telecommunications carrier in New York, where messages are received from Source members and processed in "batch" mode. This method gets around the problem of sending the minimum 200 letters a day as required of E-COM corporate clients.

The Source can be contacted at 1616 Anderson Road, McLean, VA 22102 (703-734-7500).

For information circle number **57** on your reader service card.

Executive News Service Part of CompuServe's Executive Info Service

The Executive Information Service, part of CompuServe's entire data base service that includes a consumer information, communications and personal computing, offers services designed for executives. Included are InfoPlex®, an electronic mail system that provides access to E-COM (U.S. Postal Service); Ticker Retrieval, a cross reference of all information available for any company you specify; twenty-minute delayed stock market quotations; and MicroQuote II®, an enhanced version of MicroQuote® that now provides searching for securities based on various investment criteria.

Announced recently as part of this executive service is the Executive News Service, which lets you screen information coming across the AP News Wires for stories containing key phrases.

CompuServe can be reached at 5000 Arlington Centre Boulevard, P.O. Box 20212, Columbus, OH 43220 (800-848-8990).

For information circle number **58** on your reader service card.

Peripherals & Accessories

Blueprints for Learning

Onset Services announced the Blueprint Series, a set of learning tools for application software and operating systems. Each "blueprint" is actually a poster-sized chart arranged to show the flow of a program, including keystroke commands and explanations.

The blueprints are divided into sets for CP/M, PC-DOS, WordStar and MailMerge, dBASE II, Lotus 1-2-3 and SuperCalc.

Each set of the Blueprint Series is priced at $12.50 (plus $1.50 shipping), and the entire series is available from Onset Services, 318 South B Street #2, San Mateo, CA 94402 (415-573-1919).

For information circle number **59** on your reader service card.

Continued from page 6
and disk storage capacity to support multiple users.

MP/M II is the predominant multiple-user system on eight-bit computers. Its counterpart in the sixteen-bit world is MP/M-86, which is designed to take advantage of sixteen-bit processors.

One of the virtues of using CP/M is the fact that data files are the same from one computer to another. Digital Research invented CP/Net to link computers together in a network to share data at the same time.

Two reasons for "networking" are sharing one large capacity disk among several computers, and sharing other devices like printers and modems. For example, several people using different computers can share a common data base. One person can send information to the printer while another is actually using the printer. Both users can continue working without waiting for the printing to finish.

CP/M-86 and MP/M-86

When the 8086 and 8088 processors arrived, DRI was ready with CP/M-86. CP/M-86 is very similar to CP/M-80 and both systems can share the same data and files. The difference lies in the fact that CP/M-86 can manage more than 64K memory and can take advantage of other features of the 8086 and 8088 processors to increase speed and handle larger programs.

Programs must be converted from CP/M-80 to run in CP/M-86. Some programs require very small changes, and others require greater ones depending on how they were designed.

CP/M-86 has new features not found in regular CP/M, but most of the commands are the same. MP/M-86 is a remarkable improvement over MP/M II because it can take advantage of the extra memory provided with sixteen-bit computers.

CP/M-86 was not popular on the IBM PC at first because IBM priced it high ($250) compared to its own PC-DOS ($40 or free with the computer). DRI has produced a new version of CP/M-86 (offered at $60).

DRI has also created a "free" version of CP/M-86 called SpeedStart, which is stored on each application program disk in the DRI Applications Library for the IBM PC. For the price of the application program alone you get SpeedStart, too. The SpeedStart system lets you insert an application disk into drive A and start the program immediately (the CP/M-86 system automatically starts the application program for you).

CP/M-86 is considered to be an excellent alternative to IBM's PC-DOS, and its graphics extension (GSX-86) is becoming a standard graphics "environment" among different computer manufacturers. CP/M-86 provides a common file structure for use with other sixteen-bit and eight-bit computers, and a way to grow into Concurrent CP/M-86, perhaps the most useful personal computer operating system.

Concurrent CP/M-86

As people use personal computers for more and more tasks, they begin to see the value of *concurrency — the capability to run several programs simultaneously. You could, for example, write one report while simultaneously printing another and calculating a third.*

Single-user computers can have concurrency with Concurrent CP/M-86, an operating system for computers with the 8086 or 8088 processors (such as the IBM PC). Concurrent CP/M-86 is similar in nearly every aspect to CP/M-86, with the additional capability to running programs in the "background" while running a program in the "foreground."

Concurrent CP/M-86 is proving to be very useful in office environments and in CP/Net "slave" workstations where you can use a communications program to handle electronic mail while performing other activities on the same computer.

Compatible Systems

It is not unusual for manufacturers to be licensed to produce different versions of the same operating system. Usually the versions are tailored to specific machines. Licensed versions of CP/M operate in the same way as regular CP/M, with only internal performance differences and possibly additional utilities provided by the computer manufacturer. Since there are hundreds of different computer manufacturers, we cannot describe all the possible utilities and performance differences here. Consult the manuals supplied with the computer for information about additional utilities and performance data.

In addition to licensed versions, there are also "CP/M-lookalike" operating systems that perform the same basic functions as CP/M, including the function of running any CP/M-based application program, except that they perform the functions faster or easier, or they perform more functions than CP/M. We call these operating systems "CP/M-compatible."

Two well-known CP/M-compatible systems are IMDOS, the operating system of the IMSAI microcomputer, and CDOS, an operating system from Cromemco. These systems are bundled with the computers and are so close to CP/M that they are sometimes called "CP/M clones."

Other well-known CP/M-compatible systems are:

- OASIS, a multi-user system (Phase One Systems, Oakland CA), found on S-100 computers.
- TurboDOS (MuSYS Corp., Tustin CA) found on S-100 computers.
- MMMOST, found on the TeleVideo TS816 computer.
- Zeus4, a multi-user system for OSM computers.
- SDOS (from SD Systems) is based on CP/M version 1.4.
- TPM I and II (from Computer Design Labs, Trenton NJ) is a souped-up version of CP/M for Z80 processors.

© 1984 TUG, Inc., *User's Guide* vol 2.1 no. 7

Versions of CP/M for each of the Radio Shack TRS-80 computer models are available from several different vendors. Circuit cards containing Z80 or 8085 processors can be added to Apple and Commodore computers to allow them to run CP/M. There are also souped-up versions for Heath H89/Zenith Z89 computers.

Nearly every CP/M computer runs tailored CP/M that works with a specific type of disk drive and perhaps a specific keyboard/display unit. However, most CP/M computers run a system that closely resembles a member of DRI's family. The "clones" are used mostly by computer professionals and application system packagers.

Some Popular Computers

CP/M is supplied for several popular computers from the manufacturer, or from vendors if the manufacturer does not supply it. You may already be an owner one of these computers or considering the purchase of one; if so, you can get CP/M from your computer dealer.

IBM PC

CP/M-86 and Concurrent CP/M-86 are both available for the IBM PC from IBM PC dealers. DRI also offers "application packs" with SpeedStart — a version of CP/M-86 included with application programs for the IBM PC.

The GSX-86 graphics extension is also available for the IBM PC, as are DRI's graphic applications tools.

CompuView Products produce a version of CP/M-86 they claim is faster than the regular version. In addition, Xedex offers the Baby Blue — a plug-in circuit board to add to your IBM PC to make it run "regular" CP/M-80 and eight-bit CP/M programs. Since many CP/M-80 programs require modification for terminal characteristics, the Baby Blue was designed to make the PC appear to be a TeleVideo terminal.

Apple and Commodore

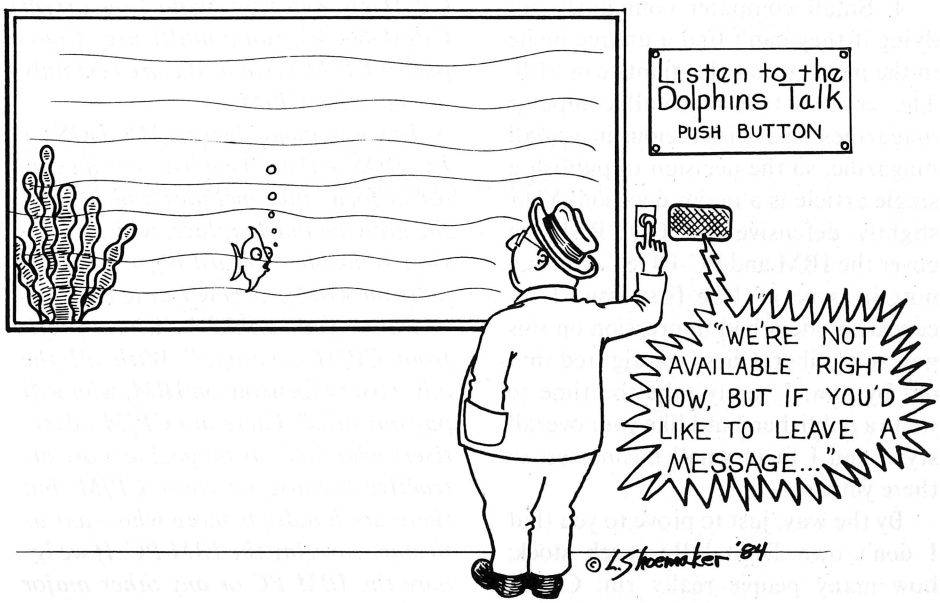
DRI, Microsoft, MicroPro and others offer add-on circuit cards for the Apple II and IIe computers that provide an additional Z80 processor for running CP/M-80. The add-on card causes the Apple to act like a CP/M machine.

Data 20 Corp. (Laguna Hills, CA) offers a CP/M add-on card for the Commodore 64, with a large catalog of CP/M software available. Commodore has also announced a CP/M card to be available in early 1984.

Tandy/Radio Shack

CP/M-80 for the TRS-80 Model 2 has been available since the Model 2 was introduced. It quickly became the most popular system to run on the Model 2 (over Tandy's TRSDOS).

CP/M Plus is available from Tandy for the Models 2, 4 and 12, and several vendors offer CP/M for Models 1 and 3. CP/M Plus and CP/M 2.2 are both available for Radio Shack computers from third party vendors such as Pickles & Trout (Goleta, CA) and Aton International (Santa Clara, CA)



Letters... continued from pg. 24

Editors,

... here's some feedback. I subscribed to your magazine for CP/M 2.2 coverage. That's what *CoEvolution* said you were. Please keep some things in mind:

1. CP/M 2.2 has relatively little media coverage now that IBM's monopolistic opportunism has mesmerized the world of the executive. The media chase money like they "should," but the small manufacturers and pioneer buyers are left behind if they can't cough up $4000 — $9000 for a machine that IBM admits cost them a few hundred to produce.

2. *PC* Magazine and *PC World* are universally available. They are cheaper than your magazine, published monthly, four times as thick per issue, massively advertised... In short, you're tilting at windmills if you think you can compete with their coverage of that system. If you feel that you're just not "in" if you don't cover the 8086/8088's, then at least cover the little folks with their IBM PC-compatibles and add-on boards for 8080/Z80 systems. The IBM PC is the antithesis of a "people's" computer. I've got nothing against 16 bits, but IBM is loathsome. Do you really think your readers own lots of IBM PCs?

Continued →

3. CP/M 2.2 is becoming available on nearly every micro, from the Commodore 64 on up. Wouldn't it be an honorable, perhaps even more profitable, path if you focused on tales and methods of making CP/M truly portable? Like, how to get public domain CP/M to run on the new Commodore 64 CP/M 2.2 card? No one covers that realm, yet it could bring real computing power to a great many less-than-wealthy real people. I would hope that anyone connected with Stewart Brand would jump at such democratic road.

4. Small computer companies are dying if they can't find a unique niche in the market that the giants can't fill. The same is true of small computer magazines. Space is precious in a small magazine, so the decision to publish a single article is a major decision. Your slightly defensive "of COURSE we cover the IBM and PC-DOS" editorial note in issue #5 (the first issue I received) made a bad impression on this new subscriber. Guess you figured that out by now. I rarely take the time to write a publisher, but I like your overall style, and I favor small businesses, so there you are.

By the way, just to prove to you that I don't own Digital Research stock: how many people really run CP/M 3.0? Why bother, when ZCPR and other shells are available for CP/M 2.2 and CP/M 2.2, and CP/M-86 is there for those few who really need mega-RAM?

I'm sorry that my 2 cents worth is so negative, but I am a subscriber, and glad to be one. And this letter does contain money, which talks as well as I do. I want magazines like yours to succeed whether I remain on your subscriber list or not.

I own a Kaypro 4. I use a TeleVideo terminal, an IBM terminal, and an IBM Displaywriter at work. Others own them.

Thomas Hope Norman, OK

Thanks for the feedback. We are listening attentively. We agree wholeheartedly about IBM's dastardly domination, but can we really do *anything about it if we're not paying attention to it? What about the "little folk" who need to communicate with somebody else's (e.g., their boss's) IBM PC?*

At least 10% of our subscribers actually own *PCs — the same percentage owns Zenith, Apple and Kaypro (CP/M) computers. We owe it to these subscribers to devote at least 10% of our coverage of computers to the IBM PC.*

We are centered on CP/M 2.2, interested in the new CP/M Plus, covering CP/M-86, and wild *about Concurrent CP/M-86. We run a multi-user CompuPro CP/M system. We are certainly not ignoring CP/M.*

But we cannot ignore MS-DOS or PC-DOS, either. We must keep an editorial focus that includes a portion of the growing marketplace, which is obviously headed toward big-time competition (IBM vs. AT&T at least).

Funny you should mention "profit from CP/M coverage." With all the advertisers focusing on IBM, who will pay our bills? There are CP/M advertisers who find our magazine more attractive because we cover CP/M, but there are hundreds more who want us to start covering the IBM PC. If we ignore the IBM PC or any other major computer, we might not get the revenues that every magazine needs to stay in business.

We don't consider ourselves competition with PC World *or* PC *or any other magazine, for that matter, because no other magazine provides the level of hands-on detail in tutorials, the hands-on approach to reviewing and providing opinions on a product, and "impatient user's guides" on software and systems. They may consider us competition, but that is symptomatic of the paranoid magazine publishing industry.*

— editors

Editors:

Currently I'm switching from an Osborne 1 to an IBM PC with PC-DOS as the operating system, so I'm hoping that you will be including PC-DOS as well as CP/M software as you mentioned in the literature from your booth at the SF PC Faire.

Since I work a lot with WordStar, Documate Plus, and MailMerge, it was good to see them featured prominently in your early issues — hope it continues. I am always looking for ways to get the most out of these programs.

I also do some on-line searching through Dialog (mainly CAB, medline, Exerpta Med, IDA, PMI) and am switching over to Crosstalk — I'd sure vote for some in-depth coverage of Crosstalk.

Also, after your in one of the data base files, do you know if it's possible to send in (possibly using pre-programmed SFK's) your search strategy rather than spending an inordinant (at least for us non-typists) amount of time typing in a bunch of alternate terms or decimal codes (esp Medline)? So far no one has given me a definite answer, possibly because I haven't asked the right question, but it would be quite advantageous if I could type in my search strategy beforehand and carefully check the accuracy then press one key to enter my different search strings at the right time.

Anyway, you have a fine publication and I hope it takes off!

M.M. Mastin, DVM
Veterinary Interface
Oakdale, CA

Thank you for mentioning the fact that you use WordStar, etc. on the IBM PC with PC-DOS. We try to make our tutorials work for both CP/M and PC-DOS users, with differences highlighted.

Search strategies can definitely *be "downloaded" to the data base. This is often overlooked or never stated by the companies that run the data bases, because they charge you for the time it takes to type the search strategies by hand. We have used various modem programs to download into the DIALOG data base, and we're preparing an article on doing just that.*

— editors

© 1984 TUG, Inc., *User's Guide* vol 2.1 no. 7

CP/M-80 •
CP/M-86 •
PC-DOS •
MS-DOS •

Proportional Printing With Perfect Writer

Quick and easy steps to make Perfect Writer print proportional-spaced characters perfectly.

by Thomas Howe

© 1983 Thomas Howe

Perfect Writer® is blessed with a little known feature that can prove very handy at times. It can print documents in proportionally spaced typeface — something Wordstar® cannot do. Some dot matrix printers (such as the ProWriter 8510) offer a proportionally-spaced typeface (or "font") as an alternate character set. This new character set often looks sharper than the traditional block letters, and better for correspondence-quality printing.

Proportional printing takes into account the exact width of each character, allowing only enough space for that character before printing the next one. The result is that the letters are closer together and there is more printing on the page. When combined with seraphs on the letters, it can be attractive as well as convenient for compressing a printed document.

Many letter quality printers offer this feature. However, for the purposes of this article, I will stick to dot matrix printers. Daisy-wheel and thimble-wheel printers require a little more work than this quick introduction can afford (such as how to change your dip switch settings).

Proportional print capability is usually buried in a ROM chip in the printer and activated by an code sent from the computer. If your printer has this hidden treasure, read on. Not all printers have this magic.

In order to use the proportional printing feature, you must customize your copy of Perfect Writer. This is accomplished with the PFCONFIG program on your installation disk. Keep your manual handy, though it may not be of much help at this point. (I decided to write a 200-page book to resolve all the questions I had about this installation program.)

```
98  .bbbbbbbbbbbbbbbbb
105  .iiiiiiiiiiiiiiiii
```

Typesetting Conventions

Throughout this article we use *THIS typeface* to show exactly what you should type at your keyboard, with the special symbols ↑ for the Control key (CTRL, CNTL or ALT on some keyboards), and ↵ for the Return key (RET, CR or Carriage Return on some keyboards).

We also use This Typeface to show messages displayed by the system or by programs, and to show old text in a file where new text has just been typed (new text is in *this typeface*, of course).

Perfect Writer is a trademark of Perfect Software, Inc. (Berkeley, CA). WordStar is a registered trademark of MicroPro International (San Rafael, CA).

This job is divided into four operations. Do each operation in the order presented because each operation depends on the previous one. You should backup your disks between steps.

Step One: The Basic Configurations

Assuming you are already using Perfect Writer (and have a working disk in use), erase the PF.DAT file from the *installation* disk.

NOTE:
You should first make a backup copy of all disks before altering the program, in case something goes wrong. Then use PIP to copy your working PF.DAT file from your editing disk to the installation disk. You are now ready to install proportional printing for your printer.

Most CP/M systems have two drives (I did my work on a Kaypro II). Place the installation disk in drive A and type:

A⟩*PFCONFIG*↵

The program starts up and reads the data contained in the PF.DAT file on that disk. After displaying three screens of information designed to scare you away from doing this job, the program presents a menu of six options. Don't be scared, no matter how bad it sounds!

From the first menu select option 2, Define Printer Types. This will take you immediately to the second menu, the Printer Type Definition Menu.

Select option 1 (List current printer definitions) to review the printer configurations already stored in your copy of Perfect Writer. Note which configurations work and which do not. You must spell names correctly (this is true at all times when working on or with Perfect Writer).

There is room for up to 15 definitions in this list. You may have to delete some to make room for your new work. Deletion is accomplished by using option 4 of this second menu. You will be asked to enter the name of the printer to be deleted (one name per deletion). Delete some not-needed printer definitions if you need to make room. Allow room for at least 2 new definitions.

Now define a new printer (for an example I will define a proportional pica typeface). Select option 2 from the Printer Type Definition Menu to do this. Enter the name of the new "printer" (typeface) as *PPICA*. Note that I have suggested a mnemonic name in keeping with the tradition of Perfect Writer.

You are then presented with the usual twenty-four questions. See figure 1 for a synopsis of these questions along with the answers for defining a proportional pica typeface on the ProWriter 8510 dot matrix printer.

Perfect Writer stores the answers to these questions in the PF.DAT file (the file you just copied onto the installation disk) for reference when formatting your documents. For this job, answer most of them just as you would in defining a normal incremental elite typeface. I will only point out the exceptions to this rule (to save space). However, remember that you must answer all the questions every time you define a new typeface.

Question 7 is the first exception to normal printer definition. Answer *YES* to this one to tell Perfect Writer that this is a proportional typeface. This sets into motion a special set of printer drivers in the formatter program to accommodate the special requirements of proportional spacing.

The next exception is the 8th question, which only appears when you answer *YES* to number 7. You are asked to select a character width table. Because the characters have different widths (an "i" is skinny compared to an "M"), you must tell your computer exactly

FIGURE 1: The following is a completed synopsis of the 24 questions defined for the PPICA typeface on the ProWriter. Exceptions to normal printer definition are shown in *this typeface*. This is only an example — use the correct codes for your printer.

1. Paper width: 21590
2. Paper height: 27940
3. Standard character width: 254
4. Height of single spaced line: 423
5. Smallest horizontal movement: 254
6. Smallest vertical movement: 17
7. Proportionally spaced font? *YES*
8. Number of the character width table: *0*
9. Generate on-line readable output? NO
10. Initial paper offset: 0
11. Special printer code: 1
12. Use Control-H for backspace? NO
13. Use carriage return (Control-M) for bare carriage return? YES
14. Use form-feed (Control-L) for form feed? YES
15. Type of synchronization protocol: 1
16. Translate characters on output? NO
17. Number of character translation table:
18. Initialization string: ↑[N↑*[P*↑6↑5
19. Reset string: ↑N↑*X*
20. New line string: ↑M↑J
21. Bold face ON string: ↑[!
22. Bold face OFF string: ↑["
23. Italics ON string:
24. Italics OFF string:

Figure 1. *These are the questions asked by PFCONFIG during the process of defining a special "printer type" for a proportional-spaced typeface. Usual answers for a pica typeface are provided, with special answers in italics.*

© 1984 TUG, Inc., *User's Guide* vol 2.1 no. 7

#	ASCII	micas	#	ASCII	micas
32	<sp>	105	80	P	210
33	!	115	81	Q	258
34	"	162	82	R	242
35	#	226	83	S	194
36	$	195	84	T	226
37	%	258	85	U	242
38	&	210	86	V	258
39	'	115	87	W	272
40	(	115	88	X	188
41	)	115	89	Y	226
42	*	195	90	Z	188
43	+	195	91	[	195
44	,	115	92	\	195
45	-	195	93	]	195
46	.	115	94	^	195
47	/	195	95	_	180
48	0	195	96	`	115
49	1	195	97	a	195
50	2	195	98	b	195
51	3	195	99	c	163
52	4	195	100	d	195
53	5	195	101	e	195
54	6	195	102	f	163
55	7	195	103	g	195
56	8	195	104	h	195
57	9	195	105	i	124
58	:	115	106	j	115
59	;	115	107	k	163
60	<	195	108	l	134
61	=	195	109	m	258
62	>	195	110	n	195
63	?	195	111	o	195
64	@@	230	112	p	195
65	A	258	113	q	195
66	B	242	114	r	162
67	C	225	115	s	195
68	D	242	116	t	162
69	E	242	117	u	195
70	F	242	118	v	195
71	G	225	119	w	258
72	H	242	120	x	195
73	I	147	121	y	195
74	J	230	122	z	162
75	K	195	123	{	162
76	L	230	124	|	115
77	M	263	125	}	162
78	N	257	126	~	195
79	O	242	127	^?	300

Figure 2. *Part of an ASCII chart showing characters in the range from decimal 32 to 126 and the appropriate mica widths.*

how wide each character is so it can calculate exactly how many and where to place characters on each line it prints. This information is stored in a width table. For now, select table number zero (0), because it will always work after you are done with this tutorial.

Two other questions directly affect proportional typefaces. Questions 18 and 19 for setting the initialization and reset strings must be altered. Define them as usual for the incremental pica typeface with this exception:

1. Add to the initialization string the control code that turns on proportional printing for your printer.
2. Add to the reset string the control code to turn off proportional printing.

For my ProWriter 8510, I added an Esc-*P* to the initialization string and an Esc-*N* to the reset string (see figure 1). After experimenting a little you may want to try adding some "dot spacing" commands to help special features print cleaner. The printer manual contains the codes your printer requires. Enter them as ASCII control or escape codes exactly as listed.

Having done this for all the different proportional typefaces you desire, exit the program (use option 6 in both menus) to do a little testing as described in step two below. This is a good time to make a copy of the PF.DAT file on a separate disk as a backup to use in recovery in case the file is somehow ruined.

Step Two: A Preliminary Test

Use Perfect Writer to prepare a special test document. Once you have typed the document, you will print it, and calculate your character widths from it. The character width information is vital. The procedure is simple, though a little boring.

Look in your printer manual (*or figure 2*) for an ASCII character chart. Note the characters in the range from 32 to 126 (decimal numbering).

Enter Perfect Writer and open a new file named WIDTH.TST. Prepare yourself for a bit of slightly tedious typing made easier by Perfect Writer's universal repeat command.

Put at the head your document the following command at the top left of your screen so that Perfect Writer will be forced to print everything exactly as you type it:

@BEGIN(VERBATIM) ↵.

Begin this document with a number in the left-most column of the screen, starting with number 32. Press the Tab key for a space. Now type a period. Press Escape, type *50* (to use the universal repeat function), then touch the space bar. Instantly, you will see the

```
73    .IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII.

77    .MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM.

87    .WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW.

98    .bbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbbb.

105   .iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii.
```

Figure 3. *Portion of the test document WIDTH.TST used to test character widths.*

cursor advance 50 blank spaces to the right. Type another period followed by three Return keys.

The result will be a line starting with 32 followed by a tab space, a period, fifty spaces, and another period. This line is a reference point for the next lines you prepare.

For every character in the ASCII range from 33 to 126 (32 is blank), prepare a similar line with the 50 blanks between the periods filled with the character. Type three Return keys at the end of each line. Put the decimal ASCII number of the character in the left column of the line as a reference so you won't lose your place. Refer to the portion shown in figure 3.

After the last line type *@END(VERBATIM)* ↵ to end the test document WIDTH.TST.

Save this document to disk with the Control-*X* Control-*S* command. Make a backup copy, then format the test document and print it using your regular incremental pica typeface (this should be your default typeface in most cases). Proofread it for errors and verify that you did not miss any characters. The test document should be six printed pages. If everything is right, proceed.

Format and print WIDTH.TST again in a proportional pica typeface, the one you just finished defining. It is important that you use pica for this one as this is the standard reference point Perfect Writer will use.

Remember when you chose character width table zero to set up your printer configurations? The reason is that the widths in this table are all set at 254 micas (there are 2540 micas in an inch), the width of standard pica type. This is convenient now because it will make our calculations simple.

The following calculations should take only about 15 minutes. Find a ruler, preferably metric. Measure measure the widths of each character in the ASCII table that you have printed. I recommend a steel ruler (like print shops use) because it will be easier to read and reasonably accurate. Measure each line you have printed from period to period. Record the measurement beside each line.

Now it is time for a test in simple arithmetic. Use the following formula to calculate the width of each character in micas. If you are measuring with an inches ruler, you will first have to convert all the inches to millimeters (I hope you are accurate to 0.01 inch.)

$$\text{Character width in micas} = \frac{\text{YY.Ymm X 100}}{50}$$

This formula can be simplified to say: multiply the metric length of each line by two and consider only the resulting whole numbers to be significant. Round up to the nearest whole number if you need to. For example, in a line that measures 108.5mm in length, each character is 217 micas wide.

Save these results and prepare for the final step in customizing Perfect Writer to print proportionally.

Step Three: Editing the Character Width Table

After relaxing a bit, place your installation disk in drive A once again and start PFCONFIG. This time, select option *4* from the Main Menu in order to Edit Character Width Tables. You will be presented a menu with three choices:

```
1  Enter character width values
2  List current width values
3  Return to main menu

Enter the number of your selection,
followed by a <CR>
```

You may wish to view the contents of table 0 to verify that the current widths are all 254 micas. This is done with option *2*. When asked which table you want to view, respond with *0*↵ .

Select option *1* and table *0*. Now start entering the new widths for each character as you calculated them. I recommend that you select table zero for this so you don't have to go back and change your other configuration work. Table zero is also easier to recover from errors if you should accidentally blow it totally. All the original values are 254 micas. (Don't bother looking for table 4. It is a phantom that does not exist.)

New character widths are entered by first selecting the decimal reference numbers of the characters you want to edit. It is a good idea to do ten at a time so that you don't miss any and so you can recover from errors more easily. As the characters are presented on your screen, type the width value you calculated followed by Return. If you spot a mistake before typing the return, simply use the backspace key to erase the mistake.

You should go all the way through the list. It is best if you take this job in chunks of ten characters at a time to make it easier to recover from errors. For example, select numbers 32 to 41 for your first batch and 42 to 51 for the next, and so on. You should also go back and proofread this work by viewing the table all the way through, comparing it to your notes. It is easier to correct errors now than later.

Two of these widths may have to be adjusted for correct printing. (When you test your work, you may see several widths that need to be fixed.) As you may have already discovered, Perfect Writer accomplishes right justification by padding extra spaces between words

© 1984 TUG, Inc., *User's Guide* vol 2.1 no. 7

WIZARD of OsZ™

A Contact Enterprise

"Manufacturers and Publishers of Microcomputer Software"

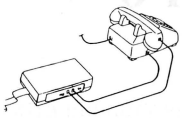
COMMUNICATIONS SOFTWARE

OSBORNE 1 **KAYPRO II**
OSBORNE EXECUTIVE **ZORBA**

Transfer any text, data or program file type. Save all or part to buffer &/or disk. Simple to use! 300 BAUD & 1200 BAUD. SenD and receive TELEX worldwide with RCA TELEXTRA T.M. or ITT Worldwide. Includes: SYS-LINK T.M. RCPMLINK T.M. SYSTOSYS T.M. TLX-LINK T.M. All For Only $99.00

Original package including PLINK and RCPMLINK (for OSBORNE I or KAYPRO II only) ..$49.95

Direct Connect MODEM incl. SOURCE (sm) subscription from only $99.00



CHECKWIZ - Checkbook Software. Handles over 1,400 check entries .....only $49.95
WIZDEX - Text file indexing software. Generates index for Wordstar .....only $49.95
OSGRAPH - Graphics program. Create Ban Charts (vert./horiz.), Pie Charts .....only $49.95
OSBRIEF - Briefing software. Create slide shows using OSBOARD I or OSGRAPH Files ...$24.95
WASH - Directory and file utility .....only $49.95

GAMES

GAMES DISK 4 - 2D Maze, 3D Maze, Bounce & Lander, Programed in C Basic $49.95
GAMES DISK 5 - Play Black Jack, Goldmine, Space War & Wizdot $49.95
GAMES DISK 6 - Pre school to College games only $49.95
KAMAKAZE OZZY - Action packed moving graphics game. Use with or without joystick $24.95
SHOOTOUT - Arcade type action games with moving graphics. Use with or without joystick $24.95
JOYSTICK PKG - Includes software with source and intermediate file with Spacewar, Esketch and Goldmine. Text file on disk. Also includes Joystick & Adapter Cable only $49.95
JOYSTICK - $14.95
Adapter Cable - $14.95

WIZARD OF OsZ T.M.
9614 C Cozycraft Ave. Chatsworth CA 91311
Visa COD (213) 709-6969 Mastercard
Add $2.50 shipping & handling, Calif. add 6½% Sales tax
OR see your local dealer

Circle number 12 on the reader service card.

until they fit the line. Hence, the width you assign to the space character will affect Perfect Writers calculations as it decides how many extra spaces to add. You can adjust this figure up or down a few micas as needed to trick Perfect Writer into inserting only the number of spaces needed. If you define the space character a little wide, Perfect Writer will be tricked into inserting fewer spaces.

The other value you may have to adjust is the width of the Delete character (ASCII decimal 127). This one is in the width table strictly for reference. Perfect Formatter uses it to know how much space to insert between sentences. I have found that a value somewhere in the neighborhood of 300-325 works nicely on my ProWriter.

When you are done with all this, exit PFCONFIG again. Your work will be saved to disk and ready to test.

Step Four: Testing

You are now ready to test your work. Copy your completed version of PF.DAT onto your edit disk and make a backup copy.

Select from one of your text file disks a document or text file that is set up for single-spaced lines and is about one full page in length. Edit the file to add some commands to cause underlining, superscripts, and subscripts. Successively format and print this document in each of the proportional typefaces you have just defined.

Examine the printed files carefully to see how well they turned out. Check the right justification, placement of superscripts and subscripts, and the placement of underlining. Make sure your printer changed type sizes correctly.

You can clean up the right justification (which should be correct to within about one character width) in three ways. Adjust the width of the space character (ASCII decimal 32) to affect the padding. Adjust the width of the delete character (ASCII decimal 127) for the same reason. If your printer allows it, go into your initialization strings and establish the amount of what is commonly called "dot spacing" between characters. All this will help the superscripts and subscripts as well. Not much will help underlining — underlining will always be off kilter until Perfect Software improves the printer routines in Perfect Writer.

Summary

Proportional printing works fairly well with the exceptions just mentioned. There are a few problems associated with right justification, underlining, superscripts and subscripts that Perfect Software needs to work out. I hope they will cure these minor ills. In the mean time, we will have to forget about underlining and accept a margin of error in those other features.

You will find proportional printing handy for your letter writing and special manuscripts. When combined with boldfacing, the printing looks superb. Letters printed this way on my ProWriter don't look like ordinary dot matrix printouts. They have a certain flair that draws more attention.

It can be especially handy for overseas correspondence where every half-ounce counts and you want to write a long letter. Simply devise a proportional typeface in compressed type, hoping the recipients have good eyesight.

If you have a daisy wheel or thimble wheel printer, check your manual for the dip switch settings. Some of these printers will clean up the right justification on their own. Note that some daisy wheel printers have a non-ASCII character arrangement on the proportional wheels and may also require you to devise a character translation table. There is way to do such a table in Perfect Writer if you have the time to figure it out.

Index to Issues 1 Through 6

How To Use This Index

Use this list of alphabetically sorted keywords, topics, commands, and definitions to quickly find the information you need in issues **one** through **six** of *User's Guide*.

References are sorted alphabetically with subtopics indented. Issue 1 pages are listed with an **i** prefix (therefore **i-6** is issue **1**, page **6**). Issue 2 pages are prefixed **ii**, issue 3 is **iii**, issue 4 is **iv**, issue 5 is **v** and issue 6 is **vi**.

The following example refers you to issue 1, page 43 and issue 6, pages 6, 8 and 27:

CompuServe i-43, vi-6, 8, 27

The subtopics listed for CompuServe are more specific. The example below refers you to issue 6, pages 6, 16, and 17 for help with CompuServe file transfers:

file transfers vi-6, 16, 17

68000 i-6
8 inch disk i-11
8080 i-6, 40
8085 i-6
8086 i-6
8088 i-6
.$$$ i-10, 22
. i-17

A> i-7
ABBS vi-26
acoustic coupler i-43, iii-14, vi-26
Alspa ACI computer i-56
ambiguous filenames i-17, 33
answer mode vi-20, 26
application, typical i-4
ASCII ii-47, vi-26
  files ii-16
.ASM i-9
ASM assembler (CP/M-80) i-38
ASM-86 assembler (CP/M-86) i-38
assembly language program i-9
assembly language subroutine i-10
asynchronous transmission vi-26
AXI: device i-21, 42
AXO: device i-21, 42

back strain iii-53
backup, program i-53
backup, text files iii-40
.BAK i-9, ii-47, iii-80
.BAS i-9
BASIC v-78
Basic Disk Operating System (BDOS) v-51, 54
baud ii-47, vi-26
BBS iii-13, vi-27
  finding files iii-18
  receiving files iii-18
  sending files iii-18
  list of RCP/M systems iii-24
BDOS Error on B: R/O i-13, 32
BDOS Error on d: R/O i-26
BDOS Error: Bad Sector ii-14, v-79
BDOS (Basic Disk Operating System) ii-6, v-51, 54, vi-54
Bell 103 vi-26
Bibliography iii-38, 49
  sort bibliographic references iii-49
BIOS (Basic Input/Output System) ii-6, v-54, vi-54
BIOS, customizing ii-7
bit ii-9, 47, vi-26
binary files ii-16
block ii-10, 46, vi-27
boilerplate ii-47, iii-70, vi-44

© 1984 TUG, Inc., *User's Guide* vol 2.1 no. 7

bootstrap iv-71
budgeting ii-4
buffer ii-65, vi-27
bulletin board system (BBS) iii-13
byte i-5, ii-9, 65, vi-27

C compiler iv-4
↑C i-7, 13, 14, 26, 33
Cache/Q vi-52
  automatic command line vi-58
  base page vi-54
  BDOS vi-54
  BIOS vi-54
  buffer space vi-54
  CCP vi-54
  configuration with extra memory vi-58
  CQ utility vi-56
  disk buffering vi-52
  internal memory vi-53
  memory banks vi-52
  memory organization vi-54
  memory size vi-55
  print buffering vi-52
  sector buffers vi-54
  sectors vi-54
  TPA vi-54
  transient program area vi-54
call-back vi-27
carrier vi-27
CBBS iii-13, 24, vi-27
CBIOS (Customized Basic Input/Output System) v-54
CCP (Console Command Processor) ii-6, vi-54
central processing unit (CPU) i-5
Centronics connector vi-24
Centronics port vi-22
Christensen protocol vi-27
.CMD i-9, 40
.COB i-9
column width ii-11
.COM i-9, 40
command, transient i-9
communication programs vi-4, 67
  answer mode vi-20
  capture displayed text on disk vi-69
  capture to print vi-70
  conversational mode vi-20
  download files vi-20, 70
  file transfers, error-free vi-72
  keyboard macros vi-73
  originate mode vi-20
  phone directory vi-72
  terminal mode vi-20
  upload files vi-20, 70
  XMODEM/MODEM7 protocol vi-20
COMMX iii-20
COMMX-PAC vi-67
Compupro S-100 Computer iv-74
  memory drive iv-75
CompuServe i-43, vi-6, 8, 27
  account i-44
  access to files vi-14
  communications vi-6
  copy files from Access vi-18
  data bases i-48, 49
  electronic mail vi-7
  EMAIL vi-6, 7
  EXIT vi-18
  file commands vi-13
  file transfers vi-6, 16, 17
  FILGE vi-6, 9
    commands vi-11
    example vi-11
  financial services i-46
  home services i-47
  log on i-45
  look up address vi-9
  professional services i-49
  providing keys vi-18
  Public Access area vi-6, 15
  reading mail vi-8
  sending mail vi-9
  submit a file to Public Access vi-17
computer communications i-43
computer system, typical i-4
CON: device i-21, 42
Control-C i-7, 13, 14, 32, 33, 35, 36
control key combinations i-13, 33, 37
Control-Q vi-27
conversational mode vi-20, 28
convert UPPER to lower case i-41
converting text files vi-30
copy file to printer i-20
copy file portion i-41
copy non-system disk i-33
copy non-system files i-40
copy system disk i-11, 32
copy system files i-41
COPYDISK i-11, 32
CP+ vi-36
CP/M 83 Report iii-30
CP/M-68 iv-4
CP/M-80 i-6, 29, 37, 56, 58
  basic introduction i-3
  definition i-3, ii-65
  file attributes i-42
  internal modules ii-6
  learning to use i-7
  quick reference i-29
  summary i-37
  tutorial i-6
CP/M-86 i-6, 29, 37, 60
  basic introduction i-3
  definition i-3, ii-65
  file attributes i-42
  internal modules ii-6
  learning to use i-7

quick reference i-29
summary i-37
tutorial i-6
CP/M commands i-37
CP/M compatibility i-4, ii-2, 33
CP/M family vi-82
CP/M, Job Stream for Radio Shack i-64
CP/M Plus iv-2
inner workings v-50
reference and summary iv-37
tutorial (part one) v-16
CP/M User Group iii-30
CPU i-5
CRC (cyclic redundancy check) vi-28
CRCK.COM i-54, iii-20
CSV format iv-8
cursor iii-65, iv-9
custom duplicating programs i-11
customizing the BIOS ii-7

d: i-37
.DAT i-9
data base ii-65, iv-5, v-6, vi-28
setting up v-6
size v-6
data directory iv-7
data set vi-28
DB-25 connector vi-24
dBase II iv-5, v-6, 8, 78
.APPEND v-12, 39
automated data entry v-35
close file v-13, 36
create data base v-9
cursor movement v-12, 15
↑X v-12, 15
↑E v-12, 15
↑D v-12, 15
↑S v-12, 15
↑Y v-12, 15
define structure v-10, 32
.DISPLAY v-11, 13, 14, 37
display data v-13, 37
edit commands v-15, 37
enter data v-12, 32
field length v-11
field types v-10
file types v-32
.GOTO v-13
index file v-39
index labels by zipcode v-40
.INDEX ON v-40
introduction v-8
LIST v-13, 37
.LOCATE v-15
open file v-13
print v-14, 32, 40
print labels v-32, 40
record pointer v-13
.SET command v-39
.SET print v-14
stop data entry v-36
subscription fulfillment v-32
tutorial (part one) v-8
.USE v-11, 13
DCE vi-24
DDT commands i-38
DDT debugger (CP/M-80) i-38
DDT-86 commands i-39
DDT-86 debugger (CP/M-86) i-39
DEC iv-3
default settings ii-5, 65
destination file i-20
devices, logical i-21
AXI: (CP/M-86) i-42
AXO: (CP/M-86) i-42
CON: (CP/M-80 and CP/M-86) i-42
LST: (CP/M-80 and CP/M-86) i-42
PUN: (CP/M-80) i-42
RDR: (CP/M-80) i-42
devices, physical i-42
diagnostic programs i-53, ii-12
DIF format iv-8
Digital Research Inc. i-3
DIR command i-7, 23, 25, 29, 34, 37
DIR file attribute (CP/M-80) i-21, 25, 36
DIR file attribute (CP/M-86) i-24, 25, 36
$DIR file attribute (CP/M-80) i-25, 36
directory i-7, ii-6
DIRS command i-8, 25, 34, 37
disaster, preventing computer i-50
disk
autoload CP/M feature iv-62
attributes i-25, 36
controller iv-71, v-59
copy i-32, 33, 35
Disk Doctor ii-12
drive read/write heads v-79
head cleaner i-53
hub rings v-79
index holes v-79
inserting a i-13, 32
jacket v-79
recover erased file iv-60
space i-34
system i-11, 29, 32
test i-53, iv-63
write-protect holes v-79
disk format i-4, 10, 32, iv-65
IBM 3380 (hard) v-58
IBM 3740 (floppy) i-11
eight-inch iv-11
disk utility iv-53
display formats, SuperCalc ii-21
display terminal ii-56
displaying files i-22, 34
.DOC i-9

© 1984 TUG, Inc., *User's Guide* vol 2.1 no. 7

Documate/Plus iii-38
Commands iii-44
...A iii-44
...COLUMNWIDTH iii-44
...DOCUMENTNAME iii-44
...FILE iii-44
...MARGINWIDTH iii-44
...PNWIDTH iii-44
...PREFIXWIDTH iii-44
...R iii-44
...T iii-44
...TOCINDENT iii-44
...X iii-44
indexing iii-41
WordStar comment line iii-41
dot commands, WordStar ii-41, 65
double-density format i-4, iv-67
double drive systems i-12, 32
Dow Jones Electronic News Service vi-28
downloading vi-28
downloading from RCP/M systems iii-13
DU.COM i-54, iv-53
DUU.COM iii-20
DU reference guide iv-53
command summary iv-57
disk autoload program iv-62
disk test iv-63
examples iv-60
notes on using iv-58
quick reference guide iv-56
recover erased file iv-60
DUMP utility i-39

↑E i-14
echoplex vi-28
ED commands i-39
editor, text ii-66
editing ii-4, 49
eight-bit data vi-28
eight-inch disk i-11
electronic bulletin board vi-28
electronic mail vi-28
electronic page ii-64
em-space iii-11
en-space iii-11
ERA command i-23, 34
erasing files i-23, 34
error-checking vi-28
ETX/ACK protocol ii-56, 65
extents i-24, ii-10

FCB (file control block) ii-10
figure space iii-11
field name iv-7
file
allocation groups ii-9
attributes i-25, 34, 36
attributes (CP/M-80) i-42
attributes (CP/M-86) i-42
attributes (CP/M Plus) v-28
concatenate i-20, 35
control block ii-10
copy i-35
create i-8
definition i-4, ii-65
destination i-20
display i-22, 34
erasing i-23
R/O i-23
records ii-9
renaming i-23, 34
size i-34
source ii-9, 20
system i-25
transfers vi-72
type i-7, ii-16
filename i-7, ii-65
ambiguous i-17, 33
extension i-7, 9
match i-17, 33
rules i-9, 29
file server vi-4
file transfers vi-60, 72
files and directory ii-6
FINDBAD.COM i-54
flippy disks iv-67, v-79
floppy disks iv-64
cross reference list iv-72
density iv-67
double-sided iv-67
formatting iv-67
sectoring iv-66
write protection iv-68
FOOTNOTE iii-38
@ iii-45
↑E iii-47
footnote file iii-47
.PA iii-45
↑PR iii-45
↑R iii-47
↑T iii-47
↑X iii-47
↑Y↑Y iii-47
.FOR i-9
formfeed filter i-41
format iii-11
format disk i-7, 10, 32
formulas, SuperCalc ii-20
full duplex vi-28
function keys ii-65

GENCMD (CP/M 86) i-40
[Gn] i-21, 34, 41
GSX graphics iv-3

↑H i-14

half duplex vi-28
hanging indent iii-11
hard disks i-17, v-56
  actuators v-58
  back up v-59
  controllers v-59
  hard errors v-60
  interfaces v-59
  seek errors v-60
  soft errors v-60
  specifications v-60
  using i-17
  Whitney v-57
  Winchester v-57
Hayes v-75
health and terminals iii-52
.HEX i-9, 40
.H86 i-40
hexadecimal numbers ii-9
host computer vi-29
hyphenation ii-65

↑I i-14
IBM 3380 format v-58
IBM 3740 format i-11
IBM Personal Computer i-60, iv-2
IBM PC-DOS vi-82
IMSAI i-55
  S-100 mother boards i-55
inserting a disk i-13, 32
.INT i-10
integrated package iv-4
Intel i-6
  format i-9
inter-character delay vi-29
internal memory i-5

↑J i-14
justify margins ii-66, iii-11

K i-5
KayPro v-44
Kildall, Gary i-3
kilobyte i-5

leading iii-11
.LIB i-10
LINK iv-34
Lisa computer iv-4
list of RCP/M systems iii-24
list driver, WordStar ii-57
LOAD (CP/M-80) i-40
local area network vi-4, 29
log file vi-29
logged disk ii-66
logical devices i-21, 42
.LST i-10
LST: device i-20, 21, 42

↑M i-14
.MAC i-10
MAC iv-34
MailMerge iii-40, 56
  automated form letters iii-72, 77
  CHANGE keyword iii-73
  combine letter with envelope iii-72
  commands iii-57
  data file iii-61, 76
  data records iii-60
  display messages iii-65
  dot commands iii-57
    .AV (ask for typed variable command) iii-65, 77
    .CP (conditional start new page command) iii-77
    .CS (clear screen command) iii-74, 78
    .DF (define data file command) iii-61, 76
    .DM (display message on screen command) iii-65, 77
    .FI (insert file's contents during printing) iii-70, 77, 78
    .FO (WordStar page footer format command) iii-64
    .HE (WordStar page header format command) iii-64
    .LM (set left margin command) iii-70
    .MB (set bottom margin command) iii-66, 74
    .MT (set top margin command) iii-66, 74
    .OJ (right margin justify/no justify print control command) iii-74
    .OP (WordStar omit page number command) iii-64, 74, 77
    .PA (WordStar force start new page command) iii-64, 77
    .PF (turn on/off print control commands) iii-70, 74
    .PL (set paper length command) iii-74
    .PN (force pagination command) iii-64, 77
    .PO (change page offset (printer left margin) command) iii-66, 74
    .RM (set right margin print control command) iii-70, 74
    .RP (repeat printing of inserted file command) iii-77
    .RV (read data variables command) iii-61, 76
    .SV (set variable command) iii-65, 77
  envelopes iii-65, 72, 76
  form, personalized letter iii-58, 61, 64, 72, 76
  insert boilerplate text iii-70, 77
  ↑KB (WordStar begin block marker) iii-65
  ↑KK (WordStar end block marker) iii-65
  ↑KW (WordStar write block to file command) iii-65
  labels, mailing iii-66, 76
    1 column labels iii-67
    multi-column labels iii-67
  list, mailing iii-60
  number of copies iii-64, 77
  ↑OF (WordStar set new ruler line command) iii-68
  ↑OI (WordStar set new tab stop command) iii-68
  ↑ON (WordStar clear default tab stop command) iii-68
  ↑OX (WordStar right margin release) iii-68
  ↑P (insert carriage return without line feed) iii-68, 77
  page numbers iii-64, 77
  print iii-64
  print book chapters iii-72

© 1984 TUG, Inc., *User's Guide* vol 2.1 no. 7

printing controls iii-66, 69, 78
read variables iii-60
setting up iii-58
skip empty variables iii-65
using temporary files iii-65
variables iii-58, 65, 76
master system disk i-6
MBOOT v-78
megabytes i-5
memory, internal i-5
memory tests i-53
merge code iii-11
merge command iii-11
MicroMate v-72
CLINK v-75
CP/M Plus v-72
HAYES v-75
IBMPC v-75
MITE v-75
T/Maker III v-74
TEXT v-75
XMODEM v-75
MicroPro International iii-56
MITE vi-67
Modem i-43, ii-66, vi-29
acoustic coupler i-43, iii-14, vi-28
direct connect i-43, iii-15
MODEM7 iii-13, 20, vi-29
auto-dial iii-16
latest versions v-78
protocol iii-23, vi-20, 60
Motorola i-6
MOVCPM (CP/M 80) i-40, ii-8
MP/M i-23
MSDOS iv-2, vi-82
.MSG i-10

[N] i-21
network ii-66, vi-22
null modem vi-25

OmniWriter iii-52
The Organizer vi-36
originate mode vi-20, 29
Osborne O1 Portable Computer i-58
WordStar for ii-60
output port vi-4

↑P i-14, 33
[P] i-21
PAIR iii-38, 48
↑B iii-48
↑D iii-48
↑PS iii-48
↑S iii-48
paragraph format iii-11
parallel connector vi-22
parallel port vi-4, 21, 22
parameters i-27
parameters, SUBMIT i-27
parity vi-74
parity bit (zero eighth bit) i-41, vi-74
.PAS i-10
PCDOS iv-2, vi-82
.PCO i-10
PC-RCPM program vi-60
Perfect Filer v-44
backups v-47
data entry v-46
field tags v-45
MOVE program v-48
print report v-46
subsets v-48
templates v-45
update records v-47
Perfect Writer vi-30
comparison to WordStar vi-32
text file conversion to WordStar vi-30
pica iii-12
PIP i-12, 32
aborted i-22
copy file to printer i-20, 35
copy to another drive i-19, 35
copy to/from other device i-20
device names (CP/M 80) i-41
device names (CP/M 86) i-41
multiple commands i-19
options i-21, 41
parameters i-41
using hard disk i-17, 35
using two disk drives i-15
using three disk drives i-15
utility i-14, 35, 40
PLINK iii-20
PMC MicroMate v-72
points iii-12
port driver, WordStar ii-57
posture iii-53
power input i-50
printer, WordStar ii-56
printing & typesetting iii-10
.PRL i-10
.PRN i-10
program
assembly language i-9
executable i-9
instructions i-4
squeeze i-54
backup i-53
diagnostic i-53
unsqueeze i-54
prompt message i-7
protocols, data communications i-43, ii-56, 66, vi-4
public domain libraries iv-53
PUN: device i-21, 42
punctuation space iii-12

quad center iii-12
left iii-12
right iii-12

↑R i-14, 33
Radio Shack Model 100 portable computer v-66
Radio Shack Model 100 to CP/M file transfers v-70
RAM i-5
RCPM Systems iii-13, vi-60, 74
calling into iii-14
downloading from iii-13, vi-60
finding files iii-18
list of iii-24
receiving files iii-18
sending files iii-18
sysops iii-30
RCPMLINK iii-20
RDR: device i-21, 42
read-only disk attribute (CP/M-80) i-25, 36
read-only disk attribute (CP/M-86) i-36
read-only file attribute (CP/M-80) i-25, 34, 36
read-only file attribute (CP/M-86) i-25, 34, 36
read-write disk attribute (CP/M-80) i-24, 34
read-write disk attribute (CP/M-86) i-24, 34
read-write file attribute (CP/M-80) i-25, 34, 36
read-write file attribute (CP/M-86) i-25, 34, 36
reading a file ii-66
reconfigure (CP/M-80) i-40
records i-24, ii-6
.REL i-10
REN command i-22, 34
renaming files i-22, 34
Return Key i-14, 33
RMAC iv-34
RO disk attribute (CP/M-86) i-36
R/O disk attribute (CP/M-80) i-25, 36
R/O file attribute (CP/M-80) i-23, 34
RO file attribute (CP/M-86) i-25, 34, 36
$R/O file attribute (CP/M-80) i-25, 36
RS-232 C cable i-43, ii-66, vi-21, 74
RS-232 connections vi-23
DB-25 connector vi-24
Rubout Key i-14, 33, ii-66
RW disk attribute (CP/M-86) i-24, 34
R/W disk attribute (CP/M-80) i-24, 34
RW file attribute (CP/M-86) i-25, 34, 36
$R/W file attribute (CP/M-80) i-25, 36

↑S i-14, 22, 33, 34
S-100 buss systems i-51, 55, iv-74
.SAV i-10
scrolling ii-66
SD.COM iii-20
SDI format iv-8
serial connector vi-21
serial data port i-43, vi-4, 21
seven-bit data vi-74
SID iv-34
SIG/M iii-30
single-density format i-5, iv-67
single drive systems i-13, 33, 56
Sorcim Corp. iv-8
Source, The vi-74
source file i-9, 20
SpellGuard iii-40
SpellStar iii-40
spreadsheet calculating ii-4, 66
.SRC i-10
SQ.COM i-54
squeeze program i-54, iii-17
STAT utility i-23, 34
structure iv-7
.SUB i-10
SUBMIT utility i-27, 36, v-78
subroutine, assembly language i-10
SuperCalc (part one) ii-18, (part two) iv-28
automatic operations iv-18, 27
average function iv-16
calulations iv-23
commands iv-25
/B iv-26
/C iv-25
/D iv-26
/E iv-25
/F iv-26
/G iv-26
/I iv-26
/L iv-27
/O iv-27
/P iv-26
/Q iv-23
/S iv-27
/T iv-26
/U iv-26
/W iv-26
/X iv-27
/Z iv-26
conditional expressions iv-25
AND iv-25
IF iv-25
NOT iv-25
OR iv-25
copy iv-25
creating spreadsheets iv-9, 25
defining display formats ii-22, iv-11, 26
deleting iv-26
deleting a row ii-23, iv-26
editing a cell iv-13, 25
entering formulas iv-10, 23
entering labels ii-23
escape key iv-23
expressions iv-24
formatting cells, rows and columns iv-11, 26
functions iv-24

© 1984 TUG, Inc., *User's Guide* vol 2.1 no. 7

ABS iv-24
AVERAGE iv-24
COUNT iv-24
EXP iv-24
INT iv-24
LOOKUP iv-24
LN iv-24
LOG iv-24
MAX iv-24
MIN iv-24
NPV iv-24
PI iv-24
SIN iv-24
COS iv-24
TAN iv-24
ASIN iv-24
ACOS iv-24
ATAN iv-24
SQRT iv-24
SUM iv-25
impatient user's guide iv-23, 27
inserting iv-26
inserting a row ii-23, iv-26
load spreadsheet iv-27
mortgage schedule iv-16
move iv-26
moving the cursor iv-9, 25
↑D iv-9, 23, 25
↑E iv-9, 23, 25
↑S iv-9, 23, 25
↑X iv-9, 23, 25
numbers iv-24
operators iv-24
operators for arithmetic iv-24
operators for conditional expressions iv-24
print spreadsheet iv-26
protection iv-26
quitting ii-25, iv-23
ratios and averages iv-14
replicating the entry iv-9, 25
replicating a formula iv-12
replicating with manual adjustment iv-14
rounding iv-16
sales forcast iv-14
saving the spreadsheet iv-12, 27
starting SuperCalc iv-9, 27
SUBMIT command iv-19, 27
summing columns iv-13
titles iv-26
"what if" calculations iv-16
windows iv-26
Super Data Interchange (SDI) iv-8
SuperSORT iii-61
switching drives i-13, 32
.SYM i-10
synchronous transmission vi-74
SYS file attribute (CP/M-86) i-23, 25, 34, 36
SYS file attribute(CP/M-80) i-23, 25, 34, 36
$SYS file attribute (CP/M-80) i-25, 36
SYSGEN i-12, 32, ii-8
sysop vi-74
system care i-50
system disk i-11, 29
copy i-11, 32
system file i-25, 34, 36, 41

tab center iii-12
left iii-12
right iii-12
settings iii-12
telecommunications ii-66, vi-74
Telenet vi-74
Televideo 950 terminal v-62
templates v-45
terminal mode vi-20, 74
.TEX i-10
text editor ii-66
text substitution program iii-40
T/Maker III v-74
TPA v-51, vi-60
transfer program v-70
transient command i-9
transient program area v-51
.TXT i-10
Tymnet i-44, vi-74
TYPE command i-22, 34
TYPESQ.COM iii-20
typefaces iii-10
typesetting iii-6
typesetting codes iii-9

↑U i-14, 33
UART v-79, vi-74
underscore ii-66
underline iii-48
UNIX iv-2
upload vi-74
upload to CP/M v-70
upload to WordStar v-70
user area i-17, 21, 34, iii-16
user area, get file i-41
USER command i-17, 34
USQ.COM i-54

[V] i-21
VDT health hazards iii-52
Videotex vi-74
VisiOn iv-4

WASH.COM iii-20
white space iii-12
Whitney disks v-57
Winchester disks v-57
Word Plus iii-38
anagram finder iii-40
crossword puzzle solver iii-40

dictionary & dictionary sorter iii-40
homonym helper iii-40
word counter iii-40
word frequency counter iii-40
word processing ii-4, 66, iii-4
tools iii-38
WordStar (part one) ii-28, (part two) vi-42
abandon ii-40, 50
boilerplating vi-44
boldface ii-42
center text ii-44, 50
changed logged drive ii-29
comment line iii-41
communications protocols ii-56
comparing Perfect Writer to WordStar vi-32
control key combinations iii-80
converting text files from Perfect Writer to WordStar format vi-30
copy block vi-45
copy block to a file vi-48
copy columns vi-49
copy file ii-30
create/edit a document file ii-30, 48
create/edit a non-document file ii-48, iii-60
cursor movement ii-32, 49
cursor movement, quick ii-36, 49
decimal tabs vi-50
delete line ii-33
delete word ii-33
disk full error iii-81
disk setup ii-54
display terminal ii-56
dot commands ii-41, iii-83
dot terminal ii-56
double-strike print ii-42
edit large file iii-81
EPROM kit for Televideo 950 terminal v-62
exit ii-38
file compatibility ii-48
file operation commands iii-80
file size iii-81
filename editing iii-80
files, organizing vi-43
find options ii-57
find text ii-51
find/replace text ii-51
footings ii-45
habits v-62
headings ii-45
hyphen help ii-37
impatient user's guide ii-48
indent line ii-36, 44
indent margin ii-42
indent paragraph ii-37
insert line ii-36, 50
installing WordStar ii-54
insert text ii-33, 49, 51
interrupt a command ii-51
join paragraph ii-38
line spacing ii-44, 50
logged disks v-78
long documents iii-81
MailMerge option iii-56
margins ii-42, 50
move block ii-50, 51, vi-45
move columns vi-49
move cursor ii-49
move quickly vi-50
page breaks ii-44, 45
page length ii-44
page numbering ii-45
paragraph join ii-38
paragraph split ii-38
place marker ii-50
prepare for print ii-40, iii-82
print commands ii-42, iii-81, 82
print menu ii-45, iii-81
print summary iii-80
printer ii-56
printer setup ii-55
quick editing vi-44
quit ii-33, 40
reading text ii-49
repeat a command ii-51
replace characters vi-51
replace words vi-51
save edits ii-32, 38, 40, 50
scrolling ii-32, 49
split paragraph ii-38
starting ii-29
subscripts ii-42
superscripts ii-42
system requirements ii-54
tab settings ii-36, 44, 50
toggles ii-50
type and erase ii-31
type over text ii-33
underline ii-42
writing and editing ii-49
wrap-around ii-66
write-protect i-10, iv-68
writing ii-4, 49
writing tools iii-38
.WRK i-10

↑X i-14, 33
Xerox iv-3
XMODEM iii-19, 75, vi-20, 75
for IBM PC vi-60
protocol iii-23
XON/XOFF protocol ii-56, 67, vi-75

↑Z i-14, 21
Z option for PIP i-41
Z80 i-6
Zilog i-6

© 1984 TUG, Inc., *User's Guide* vol 2.1 no. 7

"At last, a magazine with practical, hands-on information for computer users."

— letter to the editors

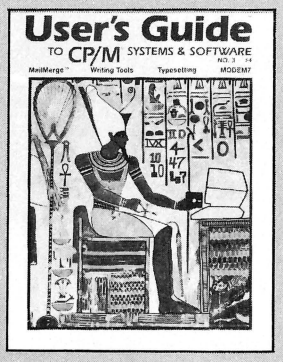
User's Guide™ *is for those who don't care about bits and bytes, but need information on how to make their computers more useful.*

User's Guide *introduces you to the world of CP/M®, the most popular type of small computer system.* **User's Guide** *provides in-depth coverage of CP/M systems and software.*

For example:

- *How to get more mileage out of popular CP/M programs like WordStar®, SuperCalc®, and dBASE II®.*
- *How to gain access to thousands of* **free** *programs in the public domain using a program called MODEM7.*
- *How to recover data from a damaged disk.*
- *How to set up and use a small business accounting system.*

User's Guide *features well written articles and clear, step-by-step instructions that help you get the most out of your computer investment.*



User's Guide
TO CP/M SYSTEMS & SOFTWARE

☐ Send me six issues for $18, payment enclosed, or ☐ Bill me $21.
☐ Foreign (pre-paid): Canada & Mexico $22/six issues, overseas $40/six issues (airmail).
We accept Visa and Mastercard. Phone: 415-851-4836

Name _____

Company _____ Title _____

Address _____

City, State, Zip _____

☐ Check if you do not want promotional mailings.

Make checks payable to: User's Guide. Offer expires 3/31/84
Subscription Dept.: P.O. Box 3050, Stanford, CA 94305.
Please allow 6-8 weeks for processing.

CP/M is a trademark of Digital Research.
WordStar is a trademark of MicroPro International.
SuperCalc is a trademark of SORCIM Corp.
dBASE II is a trademark of Ashton-Tate.
User's Guide is a trademark of TUG, Inc.

ATL-UG6

CompuPro's Model 68K...

Because Computers Shouldn't Blink.

Nothing is more aggravating to high-level computer users than a system that takes a little shut-eye every time they get on the bus. The System 816™ Model 68K™ utilizes **CompuPro's** swift, sure CPU 68K, the jet-speed choice for scientists, industrial integrators and software developers. Consider the memory: 256K of 16-bit RAM, 2.4 megabytes of disk storage and **CompuPro's** M-Drive/H™ for 1.5 megabytes of ultra-fast RAM-based disk memory. Consider the ports: Four serial ports, one Centronics printer port and one parallel port. Consider the software: CP/M-68K,™ Forth and C languages. And now consider the price: **$8,995**.

RAM 22™...

Because Memories Shouldn't Bloat.

If your random access memory is acting sluggish and overfed, **CompuPro's** RAM 22 provides a warehouse of extra space. You get an extra 256K x 8 (or 128K x 16) of memory, on a state-of-the-art board that operates up to 12 MHz. RAM 22 draws half the power of dynamic equivalents, but offers the speed and reliability of fully static operation. **$1,750** (ASM), **$1,950** (CSC).

CPU 68K™...

Because Processors Shouldn't Blunder.

Ever have the feeling your commands are in the hands of a blundering gnome? **CompuPro's** indomitable CPU 68K brings state-of-the-art efficiency to your programming tasks. Operates up to 10 MHz, and works with both 8- and 16-bit memory. **$695** (ASM), **$850** (CSC).

CompuPro products are compatible with all S-100/IEEE 696 hardware. For business, scientific and industrial computing solutions, call **(415) 786-0909** ext. 206 for the location of the **Full Service CompuPro System Center** nearest you.

CompuPro®

A *GODBOUT* COMPANY

3506 Breakwater Court, Hayward, CA 94545

System 816, Model 68K, CPU 68K, RAM 22, M-Drive/H and CP/M-68K are trademarks of CompuPro.
Prices and specifications subject to change without notice.
©1983 CompuPro

Circle number 2 on the reader service card.